

# Municipal Journal

Volume XLI.

NEW YORK, NOVEMBER 30, 1916

No. 22

## REPAIRING FLOOD DAMAGE TO SAN DIEGO WATER SYSTEM

Methods Adopted for Securing and Safeguarding an Emergency Supply while Replacing Dam and Pipe Lines Carried Away by Flood of Last January—Overcoming Transportation Difficulties—Re-use of Old Pipe.

By A. C. FRANCIS.

NOTE:—Brief descriptions of the damage done to the San Diego Water Works by the floods of last spring and of the repairs which had been begun were contained in the March 9th and May 11th issues of Municipal Journal. The system itself, with its several reservoirs and conduits, was described in the issue of June 12th, 1913, wherein will be found a map of the reservoirs and watersheds.

Among the heaviest losers in the flood which swept southern California the early part of this year was the city of San Diego, whose municipal water system suffered most severely. The greatest loss was the failure of the Lower Otay dam, which let loose into the Otay valley below it fifteen billion gallons of water, making a barren waste of what had been fertile farming lands. It has been estimated that the loss to the water system alone by the failure of this dam was more than two and a half million dollars.

The source of San Diego's water supply is in the Laguna mountains, about 60 miles east of the city. Here is located the Morena dam and reservoir. This reservoir has a capacity of fifteen billion gallons and was filled last winter for the first time in its history. From here the water is carried westward through a concrete-lined ditch of a capacity of forty million gallons daily, known as the Dulzara conduit, to Lower Otay reservoir, which acted not only as an impounding reservoir for the Upper Otay and Lower Otay watersheds, but also as a storage basin from which the city drew its supply through the Otay-San Diego and the Bonita pipe lines; the former of wood stave 21 miles long, the latter a 28-inch steel pipe line 8 miles long.

The city also maintains an auxiliary supply on the San Diego river, which flows across the city, where the Mission Valley pumping station draws water from wells and from the river direct.

San Diego has thus far spent very close to \$275,000 in repairing damage and in new construction work to take the place of the connecting link between the distributing system and the Lower Otay reservoir. Besides the loss

of the Lower Otay dam, the city suffered a great deal of damage to the Dulzara conduit, entailing an expenditure of more than \$60,000. Also both the Otay-San Diego and Bonita pipe lines were torn out where they crossed the Sweetwater river; and the wells, pumps and motors comprising the field plant of the Mission Valley pumping station were almost entirely swept away. It was only by heroic efforts that the main pumping plant of this station was saved from the flood.

The failure of the Lower Otay and both the transmission mains from the impounding to the distributing system made it necessary for city officials to take immediate steps towards getting an emergency supply of water. The Chollas Heights reservoir, on the Otay pipe line between the city and the wash-out, held an emergency supply good for 30 days if used sparingly.

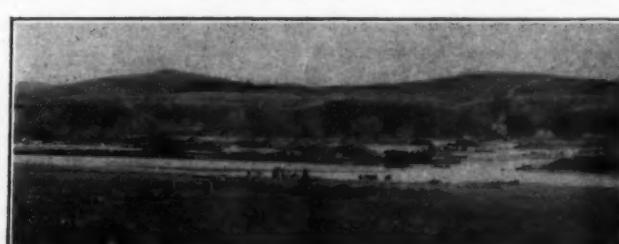
The first step taken was to get the Mission Valley plant at work. The field plant was gone, but the main pumps with the concrete sumps remained intact. A sump was dug in the sands of the river and two pumps, driven by electric motors, were placed upon the bank to pump into the concrete settling basins; from which the four-stage centrifugal pumps of the main plant delivered the water into the distributing reservoir on University Heights. This temporary supply was first delivered on the 18th of February, 22 days after the big flood had wiped out such a large portion of San Diego's water system. This plant furnished an average of a little over four million gallons daily until July, when the Otay-San Diego pipe line repairs were completed and the water turned in from the Upper Otay reservoir.

At the same time a connection was made with the Cuyamaca water system; the city receiving four and a half million gallons from this source daily, at a cost of ten cents per thousand gallons.

At the Mission Valley plant the city recovered three of the wells of the old plant and drilled nine new ones,



BONITA PIPE LINE ACROSS SWEETWATER RIVER.  
PHOTOGRAPH TAKEN JUST BEFORE THE FLOOD.



VIEW OF BONITA PIPE LINE FROM SAME LOCATION  
AFTER FLOOD OF JANUARY 27TH.

installed a complete new system of transmission from the wells to the main pumping plant, using the air lift method in place of the field pumps and motors in operation before the flood, and made various alterations to the main plant. The most important alteration was the abandonment of the suction line between the pumps and the settling basin. Instead of this line, in which there were nine bends, a tunnel has been driven under the pump house connecting the settling basin with a pit into which the suction lines of each of the two pumps extend. The water runs through the tunnel into the pit by gravity and the suction line has but one bend in it. Reconstruction work on this plant has cost the city approximately \$26,700.

While San Diego was being supplied with water from the Mission Valley and Cuyamaca systems, and while the Mission Valley plant was being reconstructed, work was being rapidly pushed on the impounding system east of the city.

The Otay-San Diego pipe line was the first of the two transmission mains to be repaired where they were washed out across the Sweetwater river. At this point 806 feet of 32-inch steel pipe mounted on a trestle had been washed out. This pipe was all recovered, and nearly all of it was used in the reconstruction work, but about 50 feet of it was replaced with cast iron, this length of

and it was necessary to lay an additional 1,200 feet and connect in at the filter plant below the outlet tunnel. This line is a 36-inch continuous wood stave for 10,000 feet, 24-inch continuous wood stave for 1,500 feet, and 24-inch machine banded wood stave for the balance of 4,700 feet. The 1,500 feet of 24-inch continuous wood stave used was second-hand pipe which had been replaced by cast iron pipe in a city street. By the use of this pipe a saving of \$1,500 was made on the total cost of the job. The Pacific Pipe and Tank Company furnished and laid the pipe, while the city built all trestles and did what excavating was necessary. The total cost was \$41,369. Both this line and the repair job on the line to the city were completed in the early part of July, when the water was turned in from Upper Otay.

No time was lost in getting at the Dulzura conduit repair work. In the early stages of the work transportation was a vexing problem. The main highways were in a sorry state and the city's roads along the line of the conduit were almost completely gone. The first load of supplies to the Barrett dam site, the central station on the conduit, went in by pack train. It cost the city nearly \$16,000 to rebuild this road, over which all supplies for the reconstruction work on the conduit had to be hauled.

Hauling cost the city an average of \$8.60 per ton for more than 1,000 tons of supplies and materials which were delivered to the various camps on the conduit, a haul of about 40 miles from San Diego. In addition to this haul, there were many points on the conduit to which material for the work had to be carried by pack train.

In the repair of the conduit 20,315 yards of earth and debris were removed from the ditch, 1,511 feet of ditch entirely replaced, and 1,196 feet of ditch relined. Also 789 feet of wooden flume was rebuilt and 695 feet of steel flume renewed. The cost of the entire job was approximately \$60,000, and took about four months to complete.

In addition to the repair of the conduit, \$13,000 was spent in placing concrete slabs over such portions of the conduit as were exposed to danger from landslides during the rainy season. The total length of conduit covered is 3,677 feet. It was originally intended to construct 5,700 feet, but lack of funds has halted this work until some time in the future.

The Dulzura conduit empties into the Dulzura creek and thence into the Lower Otay. The Lower Otay gone, it was necessary to divert this water into the Upper Otay, and for this purpose a 36-inch wood stave pipe line is being laid from the Upper Otay pipe line to a point on the Dulzura creek, which will give elevation enough to deliver the water to the Upper Otay reservoir by gravity. It was at first intended to run this line so as to discharge directly into the upper end of the Upper Otay lake, but this route promised to be a very expensive one to follow, requiring the driving of a great deal of tunnel. In place of this route, the line is brought to a point below the dam and connected into the Upper Otay line leading to the city. To run the water into the reservoir, a valve is closed in the Upper Otay line below the connection with the Dulzura line and the water is fed into the reservoir through the same line by which it is drained. This line, known as the Dulzura-Otay line, when completed will be 23,700 feet long and will cost in the neighborhood of \$100,000. This figure includes road work which was necessary in this locality and which cost about \$10,000, and about \$11,000 paid by the city as the result of condemnation proceedings instituted to obtain a site for a diverting dam on the Dulzura creek. The city is doing all excavating, trestle building, etc., while the contractor, the Pacific Pipe and Tank Company, furnishes the pipe and lays it in the ditch prepared by city forces. This contract calls for \$52,779.81.



TRANSPORTING 24-INCH BANDED WOOD PIPE FOR UPPER OTAY LINE.

steel pipe being in such a condition that repair was out of the question. Instead of placing this line upon a trestle as it had been previously, it was put under the river sands, as was the Bonita line when repaired a little later. It is believed that the danger of having these lines washed out by future floods is less with the pipe under ground than on the trestles. The cost of this repair job was \$6,719.74.

Located about three miles due north of the ill-fated Lower Otay is the Upper Otay reservoir, an auxiliary basin with a capacity of 1,090,000,000 gallons. At the time of the failure of Lower Otay this reservoir was full and water was being discharged over the top of the dam. While the Otay-San Diego line was being repaired, another force of men was at work putting in a wood stave line from this reservoir to the outlet tunnel of the Lower Otay, a distance of a little more than 15,000 feet. On connecting up it was found that the tunnel, relieved of the pressure of the waters from above, would not hold,

Very early it was seen that this line would not be completed by the time the waters which it is to carry would be available. The Dulzura conduit repairs had been completed to such an extent that the water from Pine Creek and the Morena reservoir was turned into it early in the summer. Furthermore, until the summer season came on there was a flow over the Lower Otay dam site of two million gallons from the Dulzura creek. To take care of this situation two pumping plants were placed at Lower Otay. A crib dam and sump were built a few hundred yards above the dam site and here a 16-inch centrifugal pump was set, which lifted an average of 12 million gallons daily into the main leading to the city, thus relieving the rapidly decreasing supply in the Upper Otay reservoir. Still there was water going to waste, and another, an 8-inch pump, was placed at the sump and pumped the water into the Upper Otay reservoir. By this method 179,942,000 gallons of water have been stored as an auxiliary supply. The cost of construction of the 16-inch plant was \$9,111.56 and its operating expenses were figured for the month of August at \$0.0067 per 1,000 gallons of water pumped. The 8-inch pump, delivering water to Upper Otay, cost \$1,088 to install, and its operating expenses for August figured at \$0.021 per 1,000 gallons pumped. These plants will be operated until the Dulzura-Otay pipe line is completed.

During the latter part of the summer repairs were made to the Bonita pipe line where it crosses the Sweetwater river. This is a 28-inch steel pipe which takes off the Otay-San Diego line at a point near Bonita, relieving the draft on this main. In the Sweetwater river crossing 900 feet of the Bonita line were washed out. This pipe was recovered and all except one length used in the reconstruction. This one length was buckled and bent so badly by the flood that it was impossible to straighten it out. The cost of this job was \$2,722.29.

Clarification and purification caused a great deal of labor and expense. Owing to the heavy rains of last winter, the water in all the reservoirs and that pumped from the San Diego river by the Mission Valley plant were very turbid for several weeks. Furthermore, the health department demanded that this surface water be treated chemically in order to prevent any danger of disease, and three sets of liquid chlorine apparatus were purchased for this purpose. One was placed at Lower Otay near the filter plant, another at the University Heights reservoir to care for the water pumped at the Mission Valley station, and the third was placed at the Old Town pumping station.

A settling plant of temporary construction was built at the University Heights reservoir, where, by an extensive use of aluminum sulphate, the water was clarified before being turned into the city distributing mains for consumption.

An aerating table with a capacity of 13 million gallons daily, designed in the city engineer's office, was built on the University Heights reservoir at a cost of \$1,052.27. It has a center trough 3 ft. deep, 3 ft. 6 in. wide and 128 ft. long, with four sloping steps on each side 5 ft. wide by 128 ft. long. The total over all dimensions of the table are 34 ft. by 128 ft. long.

When the Upper Otay pipe line was constructed it was found that the coagulant plant that had been used in connection with the filtration of the waters from the Lower Otay reservoir did not operate successfully on the new line. It appeared that the time allowed between the introduction of coagulant and the filters was too short to form the precipitate without an excessive use of aluminum sulphate. Another plant was then constructed on the side hill above the pipe line about midway between the filter plant and the reservoir. This

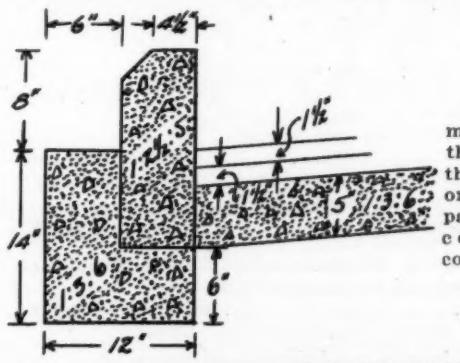
plant consists of two 2,000-gallon redwood tanks, two orifice or automatic regulating feed tanks, and one 3 h. p. gas engine and 2-inch centrifugal pump, with 300 feet of 2-inch black pipe and 300 feet of 1-inch lead pipe. This new plant made it possible to cut down the aluminum sulphate feed 54.35 per cent and obtain the same results as with the old plant. The plant cost \$1,669.62 and has already almost paid for itself in the saving in amount of coagulant used.

## BITUMINOUS CONCRETE PAVING IN MONTCLAIR

### Adjusting a Street to a Steep Side Hill—Steam Shovel Work in Shallow Excavating—Concrete and Bituminous Top.

There is under construction in Montclair, N. J., a stretch of about 10,000 feet of street—Upper Mountain avenue—which is being paved with bituminous concrete on a Portland cement concrete base, which work is being conducted in a way more systematically than is frequently the case. The street carries a large amount of traffic, mostly pleasure automobiling, although there is a certain amount of trucking over it. The automobile traffic, however, is quite heavy, the street for practically its entire length being lined with high class residences, most of the occupants of which are the owners of cars, and the street being a favorite one for pleasure driving.

The street is on a rather steep hillside, the slope of the land being about 15 per cent. As originally constructed, and as used up to the time of the present construction, the upper side of the roadway was considerably higher than the lower side. In the reconstruction, the shape of cross-section has been changed, a crown of  $3\frac{1}{2}$  inches being provided above the gutter on the west side, and 8 inches above the gutter on the east side, the crown being placed one-quarter the width of the roadway from the west gutter. The width of the pavement between curbs is 28 feet throughout. Up to the present the street has had no curb along the greater part of its length, there being a slight depression for the gutter on the east or downhill side, and a rather deep gutter and more or less high terrace up to the side-walk on the west side. With the present construction there is being provided a concrete curb, details of which are shown in the accompanying sketch, which has a face 8 inches high above the pavement on the west side, and 6 inches on the east side. This makes the top of the west curb  $6\frac{1}{2}$  inches higher than the east curb throughout.



STANDARD CURB AND PAVEMENT.

The object of making the uphill curb higher than the downhill was not only to save in cost of excavation, and in depth of fill for the downhill sidewalk and of cut below the uphill sidewalk; but also because, had both curbs been placed at the same level, the downhill curb would have appeared to be higher than the other. The

crown to which the pavement was actually constructed was determined upon after taking careful cross-sections throughout the street, and town engineer Edgar S. Clossen, to whom we are indebted for the information given here, considers that this has resulted in giving the whole street as harmonious an appearance as is possible.

One of the difficult problems was that connected with the driveways from the street to the private properties, one of which was found at practically every property. The upper side of the street was lowered in some cases as much as 4 feet in order to bring the roadway cross-section more nearly level, and this, of course, necessitated the lowering of the driveways; which in turn, in a considerable percentage of cases, required the lowering of the sidewalks where they crossed the driveways. As it was undesirable to slope the sidewalk too rapidly down to and up from these successive driveways, considerable reconstruction of sidewalks also will be necessary.

The width of the roadway originally was 32 feet, the width between property lines being 60 feet. In order, however, to provide wider grass-planting spaces and more room for the growth of trees, and to reduce to a minimum the difficulty of lowering driveways as just described, the width of the roadway was decreased to 28 feet and the sidewalk pavement set 8 feet back from the curb.

Through some sections of the street a sewer was laid, preliminary to the paving; and where this was done, not only was special precaution taken in the back filling, but the concrete base over and for about 6 inches on each side of the trench was given an additional thickness of about 6 inches.

Inlets are placed at frequent intervals on both sides of the roadway, and at each inlet a drop of  $3\frac{1}{2}$  inches is made in the gutter.

At several places along the route of the road there are springs which have been carried, some in open gutters and some in pipe drains; while the ground under and below the street has probably been more or less saturated with water as it seeps down from the hill-side. To intercept this water, drains are being placed under the upper edge of the pavement wherever such ground water is encountered, these consisting of 5-inch vitrified pipe, surrounded equally on all sides with 2-inch crushed rock occupying a cross-section area 12 inches square; the pipe being bell and spigot laid with open joints.

The contract for this work was let to the Continental Public Works Company of New York, their bids on the more important items being as follows:

For 32,500 square yards of asphaltic concrete pavement (Topeka mixture)	
laid on a 5-inch concrete base.....	\$1.80 per square yard
For 20,300 lineal feet of concrete curb on a concrete base (as per accompanying section) .....	.67 per lineal foot
For 9,500 cubic yards of excavation...	.61 per cubic yard
For 500 lineal feet of bluestone headers in place, complete.....	.71 per lineal foot
For 1,000 lineal feet of 4-inch under drains, complete in place.....	.26 per lineal foot
For 600 cubic yards of extra concrete over trenches .....	6.50 per cubic yard
For regrading 40 sewer manhole heads	3.00 each

The work was begun on July 8th of the present year.

The concrete base, 5 inches thick, is mixed 1:3:6; and on this is laid a wearing surface consisting of  $1\frac{1}{2}$ -inch bottom or binder course and a  $1\frac{1}{2}$ -inch top course.

For the wearing surface the stone is all trap rock. It is required that before it is mixed with the bitumen it shall be heated to a temperature between 250 degrees and 325 degrees F, and that the bitumen when mixed with the stone have a temperature between the

same limits. The bituminous mixture is prepared at the north end of the town on a siding of the Erie railroad, and is hauled about two miles to the work in an automobile truck.

#### CONSTRUCTION METHODS.

In performing this work the contractor conducts three separate operations systematically and keeps each several hundred feet in advance of the one following. The street is first excavated, graded and compacted by rolling. Following this the concrete is laid; and several hundred feet behind this a gang lays the bituminous surface.

#### Excavating with Steam Shovel.

Although the average cut at the centre is only 11 inches, and does not much exceed 2 feet centre cut at the maximum, the contractor has used a steam shovel for most of the excavation, one manufactured by the Marion-Osgood Company being employed. Owing to the fact that the western sidewalk is considerably higher than the roadway, and is paved throughout most of its length, and that shade trees permitted the use of only the outer two or three feet of the eastern sidewalk, the contractor left a bank or berme on the east side of the excavation by which the teams could pass the steam shovel, turn around in the roadway behind it, and again going alongside of the shovel could then receive their loads while pointed in the direction of haul. The three to five feet left unexcavated by the shovel were later removed by pick and shovel and used in levelling off the sub-grade and the surplus removed by carts. The existence of only one narrow roadway past the steam shovel caused some delay, in that carts returning empty could not pass by the shovel to turn around until the cart being loaded was out of the way. As a matter of fact, teams were difficult to obtain and this did not interfere with the use of all which the contractor could secure for the work. Could more teams have been obtained, probably a more effective method would have been adopted. As it was, a wagon was loaded about once in  $4\frac{1}{2}$  minutes during the day when the work was observed by the writer. The bucket was of half cubic yard capacity and delivered this amount regularly.

The street had previously been macadamized and no difficulty was experienced in breaking up the macadam by the bucket. When the wagon was in position the bucket was filled each twenty seconds, four or five buckets filling the wagon. While this wagon was withdrawing and an empty one taking its place, the steam shovel moved material from the west side of the roadway to the east side, so that, when loading the wagon, the boom had less distance to travel and mostly loose material to pick up. When first noted, from 22 to 25 seconds were consumed for each bucketful; but when the operator noticed that he was being watched he cut this down to 20 seconds without any difficulty and maintained this rate for an hour or more. Undoubtedly he would have operated at this rate at all times had sufficient wagons been available to keep the steam shovel busy. At intervals of a few minutes the steam shovel was moved ahead  $2\frac{1}{2}$  to 3 feet at a time, this operation consuming only two or three minutes.

The men operating at the steam shovel consisted of a lever man, engineer, two assistants, and four men with shovels who also moved the steam shovel ahead. It seemed to the writer that two of the last-named men were unnecessary.

In removing the unexcavated strip behind the steam shovel, it was first broken up by a plow with team and two drivers, and removed by fourteen pick-and-shovel men. The concrete curb had already been laid along both sides of the street and the depth of excavation was

easily regulated by these curbs. The steam shovel excavated to within about a foot of the curb on the west side.

As stated above, the men excavating by hand gave the sub-base its proper form, and when about 50 ft. was shaped up it was rolled by a steam roller, a heavy three-wheeled roller manufactured by the Buffalo Steam Roller Company being used. This roller was kept operating until the sub-base had been thoroughly compacted. Grade stakes were set in lines 12 ft. apart, there being four stakes in each line, spaced equidistantly between the curbs, the tops of the stakes being set to grade by measuring down standard distances from a string stretched between the curbs.

#### Mixing and Placing Concrete.

Behind the excavating gang came the concreting gang. The concrete was mixed in a Koehring mixer of the beam and bucket type. The broken stone and sand were hauled to the mixer over the graded road ahead of the work and deposited in piles, the stone along one side of the roadway, and the sand along the other. For taking these to the mixer, wheelbarrows were used with steel boxes, the sizes fixed so that a load when struck off with a straight edge would contain a calculated quantity, and that eight wheelbarrows of stone and two wheelbarrows of sand would furnish the aggregate for one batch of concrete. While under observation, the mixer was turning out the concrete at the rate of about one batch in seventy seconds, the batch remaining in the drum about forty seconds, thirty seconds being consumed in removing the concrete by bucket, two trips of the bucket being required for this purpose, and in the filling of the emptied drum with a fresh charge from the loader. On this work also progress was delayed by the difficulty in obtaining teams. As a result of the giving out of stone or sand at intervals, it became necessary from time to time to employ the laborers of the concrete gang in shaping up sub-grade or other pick-and-shovel work. About 600 to 700 square yards of 5-inch base a day was the ordinary rate of base construction, although 1,000 square yards could have been performed if the material could have been obtained. The gang employed on this work consisted of three mechanics on the mixer, eight men on stone wheelbarrows and thirteen filling them; two on the sand wheelbarrows and two filling them, and two handling the cement and generally overseeing the proportioning of the batch. Behind the mixer were two men shovelling and raking the concrete, two tamping it with ordinary hand tampers and one going over the surface with a stable broom.

The cement used was Portland cement manufactured by the Pennsylvania Cement Co.

#### Bituminous Surface.

For laying the bituminous wearing coat, the gang consisted of nine shovellers, three with rakes levelling and surfacing, two tampers and one man spreading cement. The material was brought from the mixing plant to the work by motor trucks of several makes hired for the purpose.

The surface was laid and rolled in two layers, a Kelly-Springfield tandem roller being used. Considerable pains were taken to see that the concrete was free from all dirt, fallen leaves and loose stone before the wearing surface was laid, and similarly that the bottom course of the wearing surface was clean and in condition to receive the top course before the latter was spread.

No hauling was done or allowed upon the concrete, all of the material for the concrete being brought to the mixer over the subgrade ahead, and all material for the asphalt wearing surface being brought to the work over

the finished pavement in the rear. The systematic progress of the work in this way was made possible by the fact that the town permitted the contractor to entirely close off the street for a stretch of nearly a half mile at a time, a procedure which would not always be possible, and which even here, on this purely residence street, undoubtedly caused considerable inconvenience; which, however, the residents were intelligent enough to appreciate would be an important factor in the securing of a first-class pavement.

## OPERATION OF SEWAGE TREATMENT PLANTS

#### Importance and Methods of Learning Amount Treated—Control by State Boards of Health of Operation as Well as Construction.

Of great importance is the report of the Committee on Sewage Works Operation and Analytical Methods of the American Public Health Association, presented at the recent convention. It again emphasizes the importance of analytical tests and proper supervision of plants and repeats the proposed list of analytical tests previously presented, as reported by Municipal Journal at the time.

Concerning the measuring of the amount of sewage treated, the committee says:

"This is of prime importance to successful operation, for otherwise retention in tanks and rates on filters are indeterminate and it is difficult, if not impossible to know whether unsatisfactory results are due to overloading of the parts of the works or to improper methods of operation.

"Where fall is available a weir, preferably with an automatic recording device, is a simple and inexpensive method to use. Where the sewage has to be pumped, the venturi meter has proven successful. In works having a dosing tank, an approximation of the rate of flow may be obtained by the use of a float-actuated counter, which indicates the number of discharges of the dosing tank. In the case of heavy flow, when a considerable amount of sewage runs in while the tank is discharging, the total discharge may be obtained by the following formula:

$$D = (n + \frac{ne}{f}) v$$

in which  $D$  = total discharge in unit of time;  $n$  = number of discharges in the same unit of time;  $e$  = time of emptying;  $f$  = time of filling;  $v$  = volume of dosing tank.

"When  $e$  is very small as compared with  $f$ , then

$$\frac{ne}{f}$$

may be omitted and  $D = nv$ ."

Concerning control of plants, the committee reports:

"In some states, associations of those interested consisting of sewage works superintendents, state engineers and others are now being formed to hold meetings periodically to discuss practical questions on operation. The formation of such bodies and their frequent gatherings are highly recommended by your committee. Such meetings stimulate interest and are sources of information to many.

"One of our correspondents stated:

We suffer greatly in this state because of unskillful operation of sewage treatment plants. Some of our plants receive almost no attention. In other cases, services are employed, but they are either inadequate or inefficient.

State.	Officer Furnishing Data.— Name and Title.	Number of Works in State.		No. of Works with Requirements Appro- priated for Construction.		State Board or Department of Health.	
		For Population of State in 1910	Total Number in 1910	25 to 500	500 to 10,000	Over 10,000	
California . . . . .	C. G. Gillespie, Chief Engineer . . . . .	2,377,560	100+	Numerous	90	3	Yes
Illinois . . . . .	P. Hansen, Chief Engineer . . . . .	5,638,600	75	4	61	10	Yes
Iowa . . . . .	L. Higgins, Sanitary Engineer . . . . .	2,224,800	85	1	82	2	Yes
Kansas . . . . .	C. A. Haskins, Chief Engineer . . . . .	1,630,300	67	9	53	5	Yes
Maryland . . . . .	R. B. Morse, Chief Engineer . . . . .	1,295,300	13	0(c)	12	0	Yes
Michigan . . . . .	X. H. Goodnough, Chief Engineer . . . . .	3,366,400	58+	34+	11	13	Yes
Minnesota . . . . .	E. D. Rich, State Sanitary Engineer . . . . .	2,810,200	38	22	14	2	Yes
New Jersey . . . . .	H. A. Wittaker, Director . . . . .	2,075,700	79	44	32	3	Yes
New York . . . . .	C. G. Wigley, Chief Bureau of Engr. . . . .	2,537,200	168(a)	66	89	13	2
Ohio . . . . .	W. H. Dittoe, Chief Engineer . . . . .	9,112,600	178	73	90	15	Yes
Pennsylvania . . . . .	C. A. Emerson, Jr., Chief Engineer . . . . .	4,767,100	162	92	64	6	Yes
Texas . . . . .	V. M. Ehlers, Sanitary Engineer . . . . .	3,896,500	40	2	37	1	Yes
Virginia . . . . .	R. Messer, Sanitary Engineer . . . . .	2,061,600	44	22	22	0	Yes
Wisconsin . . . . .	W. G. Kirchoffer, Sanitary Engineer . . . . .	2,332,800	70+	0	60+	10+	Yes
	P. C. . . . .	Totals	1,294	437	764	93	7
			1,100	34	59		

(a) Fifteen trade waste plants, etc., not included.  
(c) Many small institutional plants not included.

(d) Four additional laboratories planned for.

"The state boards of health are the logical bodies to provide this supervision, due to their uniform relation to all the municipalities in each state and with similar boards in adjacent states.

"Furthermore, the sanitary disposal of sewage is a matter generally affecting the commonwealth more than the individual community. The state is interested in requiring that sewage treatment works accomplish the best results possible, while the separate communities are naturally anxious that the works shall meet the requirements at the minimum expense for operation, additions and renewals.

"It may be assumed therefore, as an axiomatic statement, that for the good of the commonwealth, the municipalities and private owners, any procedure which will accomplish the above conditions is worthy of careful study and adoption."

The committee has found that forty-eight states have boards of health, and has divided them as follows:

"(a) Those states whose boards of health either have no engineer upon their staff, or have no specific legislation giving them control over the disposal of sewage, or have so few sewage treatment works under their jurisdiction that the subject is negligible. These twenty-four states in 1910 had a population of over 24,250,000, or 26 per cent of the total population of the United States, and are: Alabama, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, South Carolina, Tennessee, Utah, Washington, West Virginia, Wyoming.

"(b) Those states whose boards of health have an engineer or other officer charged with supervision over disposal of sewage, but whose legal powers are limited and the number of sewage treatment works are small. The officers of this group of states have all signified their willingness to co-operate with your committee and have furnished valuable data. These nine states in 1910 had a population of 12,753,000, or 14 per cent of the total population of the United States, and are: Connecticut, Florida, Indiana, Kentucky, Louisiana, Maine, New Hampshire, North Carolina, Rhode Island, Vermont.

"(c) The remaining fifteen states have boards of health with engineering divisions and either have legal authority or otherwise exercise control over the disposal of sewage and operation of sewage treatment works. The 1910 population in these states was about 54,000,000, or 60 per cent of the total population of the United States."

The states reported having a total of 1,294 plants, only 93 of which, or about 7 per cent, were in places of over 10,000 population.

The committee believes that approval of sewerage plans by the state assures the carrying out of the work along comprehensive lines, prevents the construction of poorly designed works, and tends to uniformity of practice.

State supervision of operation of works that are in charge of untrained and technically deficient operators (as is frequently the case with small plants) protects the commonwealth and makes possible the operation of the plants as was intended. One correspondent wrote:

The greatest difficulty is in the small city where the city surveyor is responsible for the operation and whose term of office is short and uncertain. There necessity for close observation by the state board of health is urgent.

And another stated:

Our municipal sewage plants . . . . have had practically no supervision either by the state board of health or by local authorities. Many of our municipalities seem to think that after a sewage disposal plant has been installed they have finished their obligations. We have even

found cases where the local authorities were doubtful as to the location of the plant.

States containing more than half the population of the United States give their state boards of health these powers; but only in Massachusetts, Pennsylvania and Texas is the operation of sewage treatment works regularly reported to state officials, although several others are preparing to do so.

The committee then proceeds to recommend that state laws require that plans for all sewerage work (sewers, pumping stations, or treatment works) must be approved by the state board of health before construction; also that their operation be supervised systematically, both by personal visits and by requiring weekly or monthly reports from those in charge. Concerning the former it advises that the examination of plans be made with a view to securing comprehensive provisions for future growth, and to furnish an effluent of the quality demanded by the conditions of the receiving body of water, to the end that money may not be wasted in securing an unnecessary degree of purification. It is desirable that designing engineers be informed before, rather than after they have designed a plant, what the requirements concerning it will be.

The committee consisted of F. E. Daniels, C. A. Emerson, Jr., C. B. Hoover, Richard Messer, and W. L. Stevenson, chairman.

#### TRAFFIC INCREASE IN MASSACHUSETTS.

As we have taken occasion to state previously, the Massachusetts Highway Commission is one of the few which take census counts of the traffic on their highways. The first count made by Massachusetts was made in 1909. Comparing the result of this with a census on all its roads in 1915, showed that during the six years the total traffic on all roads had increased 145%. When the 1909 census was taken, 61% of the vehicles were drawn by horses, but last year only 17½% of all vehicles were so drawn. There has been an average annual increase in the number of self-propelled vehicles of about 70% and an annual decrease of about 5% in the number of

horse-drawn vehicles. Even more remarkable is the increase in motor truck travel, this increase having amounted to 230% in the three years between 1912 and 1915.

#### NEW CONCRETE PAVEMENT IN WHITE PLAINS

Type of Construction New in the East in Which Concrete Is Consolidated by Use of a "Vibrator"—  
Details of Construction.

By J. S. CRANDELL.

There is being laid in White Plains, N. Y., a type of concrete pavement, known as vibrolithic, which has not before been laid outside of Texas, although it has been laid in a number of cities in that state during the past seven years. Two stretches have just been completed, the principal one on Mamaroneck avenue, which carries a heavy suburban traffic. The method of constructing the pavement is described in the following paragraphs.

On the prepared subgrade are laid wooden forms made of boards one half inch thick and three inches wide, enclosing rectangles which vary in size with the width and arrangement of the street; on Mamaroneck Avenue they were 25 feet long and 6 feet wide. The boards are set on edge, and they form the only expansion joints in the pavement. They are left in place, and as six inches of concrete is deposited on the subgrade, the tops of the boards are therefore three inches below the surface of the finished pavement. The aggregate of the concrete is finer than that usually specified for concrete pavements.

The concrete is mixed mechanically and deposited in place by the beam and bucket method. It is then raked and smoothed to grade. Immediately a layer of trap rock that will pass a three-inch ring and be retained on a two-inch ring is spread on the aggregate and the whole surface is then gone over with rakes and large wooden floats to secure an even distribution of the trap rock.

Following this, wooden bridges made of three-inch



FIG. 1.—LAYING CONCRETE PAVEMENT IN WHITE PLAINS.

Just ahead of the concrete mixer are seen the slats laid on the concrete and two of the machines used for producing the jarring effect.

slats are placed over the concrete and are vibrated. The vibrator (Fig. 2) is a motor cycle engine, the fly wheel of which is unbalanced, mounted on a metal frame which runs on four small, wide, steel wheels. When the unbalanced fly-wheel revolves it makes the entire framework vibrate violently, thus imparting a series of rapid blows to the bridge on which it is run. These vibrations, or blows, are transmitted to the concrete, settling it so that the voids are reduced to a minimum. The action is much the same as if hundreds of mallets were being used to tamp the concrete. There is a constant spattering of grout as it is forced out when the vibrators move along the bridges. After the concrete has been vibrated a sufficient length of time, the bridges are moved forward toward the mixer and the vibrating is continued. If an observer now steps on the lately vibrated concrete he will find that it is dense and solid; he will not sink into it. There is, however, a great amount of grout on the surface, and this is desired.

It is held that the same principle obtains in concrete construction as in cabinet making. The less glue there is in a joint the stronger the joint will be, provided all parts are thoroughly covered with glue and the pieces of wood are held close together. The less cement there is in the concrete, provided there is sufficient to coat all particles of the aggregate, the better the concrete will be. The vibrator plays the same part in forcing out the excess cement to the surface that handscrews do in glueing operations.

If there are any low spots after the vibrating has been completed, they are filled with trap rock and the rock is beaten down with the large wooden floats until the surface is uniform. The concrete is then allowed to set for from 24 to 48 hours.

The entire surface is then thoroughly swept to remove the upper coating of grout, thus exposing the trap rock so that it may receive a coat of tar. A rotary broom has been designed for this feature of the work. By adjusting the pressure on the broom, or by changing the broom itself for a stiffer or a softer kind, the surface may be cleaned of all grout. It depends on the quickness with which the cement sets how soon the cleaning begins. Figure 3 shows the swept portion of the street in the background and the unswept part in the foreground. The latter was laid a day later than the former. A hose may be used to clean off any loose dirt.

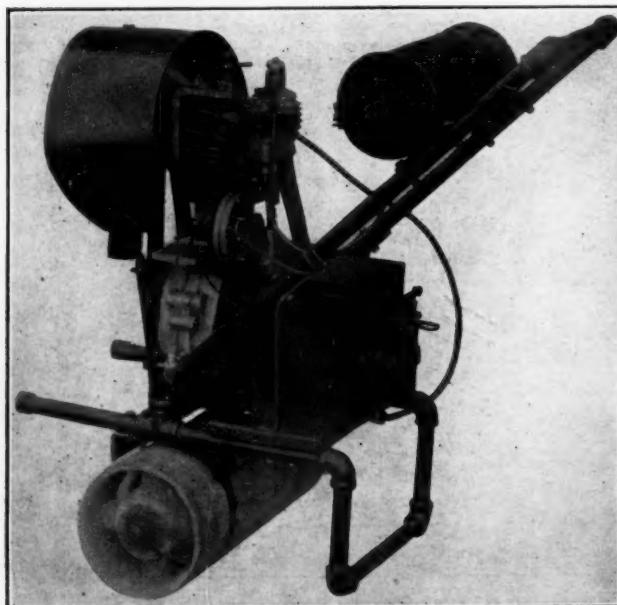


FIG. 2.—THE VIBRATOR.



FIG. 3.—MAMARONECK AVENUE, CONCRETE COMPLETED. Background has been swept, foreground has not.

The concrete is then given a coat of hot Vibro-Tar, a special grade of coal tar made for this work. About one half gallon to the yard is applied. Since the trap rock has been swept clean and free from laitance, the tar is said to adhere to it better than if applied to the usually dusty surface of cement that has thoroughly set. It is applied before the concrete has had a chance to dry out, and hence the latter slowly cures under the protective covering. It is not intended that the tar coating shall form the ultimate wearing surface. The trap rock is to take the wear after the tar has worn off; but in the mean time the tar is claimed to be doing three things of importance:—keeping moisture in the pavement so that it does not dry too quickly; providing a protective coat so that the pavement may be used in a few days, instead of waiting two or three weeks (Mamaroneck avenue was thrown open to traffic six days after the concrete was placed); and providing a wearing surface that will last during that time in a concrete pavement's existence when a wearing course of some resilient material is highly desirable. It also makes the pavement quieter. At the end of two years an additional tar treatment may be given, or the trap rock may be left exposed. Immediately after it is applied, the tar surfacing is covered with torpedo gravel, which is soon worked into the surface.

Credit for originating this method of laying concrete pavements is due to R. C. Stubbs of Dallas, Texas, and the pavement in White Plains was laid under his supervision. The motor cycle engines that run the vibrators and the rotary brooms are "Excelsior" motors. Knickerbocker portland cement was used, and the Vibro-Tar was furnished by The Barrett Company.

#### USE OF GAS INCREASING.

According to the U. S. Geological Survey, the use of artificial gas as a domestic and industrial fuel is increasing more rapidly than the use for illumination is falling off. In 1912 47% of the artificial gas sold was for illuminating, while in 1915 only 30% was so used. During 1915 the total amounts sold (by thousands of cubic feet) were as follows: For illuminating purposes, 80,796,873; for domestic fuel purposes, 129,889,230; and for industrial fuel purposes, 55,518,145. Water gas formed 59% of the first, 51% of the second, and 19% of the third; by-product gas being used for 70% of the industrial fuel purposes. The total amount of artificial gas used last year was 25% greater than in 1912, the next preceding year for which the statistics of this industry were collected by the Geological Survey.

Water gas enriched with oil—carburetted water gas—is more generally used in cities than coal gas. It amounted to 47% of the total quantity of all artificial gas sold in 1915. Gas made from oil is used almost exclusively in California, Arizona and Oregon, and to a less extent in a few other states.

# Municipal Journal

Published Weekly at  
50 Union Square (Fourth Ave. and 17th St.), New York  
by  
Municipal Journal and Engineer, Inc.

S. W. HUME, President  
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Sec'y

A. PRESCOTT FOLWELL, Editor  
W. A. HARDENBERGH and SIMON BARR, Assistant Editors

Telephone, 2805 Stuyvesant, New York  
Western Office, Monadnock Block, Chicago

#### Subscription Rates.

United States and possessions, Mexico and Cuba.....\$3.00 per year  
All other countries ..... 4.00 per year  
Entered as second-class matter, January 3, 1906, at the Post Office at  
New York, N. Y., under the Act of Congress of March 3, 1879.

#### Change of Address.

Subscribers are requested to notify us of changes of address, giving  
both old and new addresses.

#### Contributed Articles and Reports.

Contributions suitable for this paper, either in the form of special  
articles or as letters discussing municipal matters, are invited and  
paid for.

City officials and civic organizations are particularly requested to send  
Municipal Journal regularly their annual and special reports.

#### Information Bureau.

Municipal Journal's Information Bureau, developed by twenty-one  
years' research and practical experience in its special field, is at the  
command of our subscribers at all times and without charge.

#### CARBONIC ACID IN WATER.

Consumers of the Waltham, Massachusetts, water supply have found that the water delivered through the house services in that city produces a noticeable effect on brass. It is the practice in much plumbing of the better grade to use brass pipe in the connections to the hot water tank, and occasionally in other parts of the plumbing, for the reason that it does not rust as does iron pipe, and is supposed to resist the effects of other matters more commonly carried in solution in water. In Waltham, however, brass pipes have been completely destroyed in a comparatively short time.

The citizens have naturally felt concerned, not only because of the financial loss and annoyance caused by this destruction of brass, but also by the suggestion that the material or condition which would destroy brass might possibly be injurious to the health of the consumers. The State Board of Health was therefore requested to investigate the trouble and inform the city what constituent of the water it is that produces this effect, whether it is dangerous to the human organism, and whether it can be removed from the water, and how.

The board reported a few days ago that analyses showed the water to be unusually high in free carbonic acid, that drawn from the tap at one of the pumping stations showing 3.16 parts per million; and this, it reported, was the cause of the action upon brass. This, says the report, "indicates that the water would be likely to act seriously on the metal of service pipes through which it is distributed. Under the circumstances it is not advisable to use lead or brass pipe for service pipes or for distributing the water where it is to be used in drinking, since the water will be likely to act seriously on the pipe. Galvanized iron pipe would also be acted

on seriously by the water, and the coating probably dissolved in a short time."

"The quantity of free carbonic acid in the water does not affect the water for drinking, provided it is delivered through proper pipes."

#### SEWAGE DISPOSAL FOR CHICAGO.

Just about seventeen years ago Chicago placed in operation the drainage canal that diverted a large part of the sewage of the city from Lake Michigan to the Desplaines river. This served its purpose of preventing pollution of the lake to such a degree that the typhoid death rate was cut down from 175 per hundred thousand to less than 5 per hundred thousand. However, the capacity of the canal is, of course, limited and for some years it has been realized that it is not sufficient to dilute the increased amount of sewage which reaches it from the growing population and prevent nuisance therefrom.

The only solutions practicable for meeting this condition of increasing seriousness appear to be either increasing the amount of dilution by enlarging the canal and pumping more water from the lake (which latter we believe the Federal Government will not permit), or to relieve the present flow of the canal of a great part of the work of purification which it now has to perform by removing some of the organic matter from the sewage before it enters the canal. For several years the city has been operating a sewage experimental station, with a view to collecting data to be used in designing the most effective process plant for securing such partial removal of organic matter.

The latest action is that taken by the Board of Trustees of the Sanitary District of Chicago, on November 24th, upon which date they passed a resolution directing the chief engineer to prepare at an early date plans and specifications for the construction of such work as will carry out the recommendations of the Committee on Engineering, together with the detailed estimates of cost. The recommendations of the committee referred to were that works be constructed for the removal of solids from sewage which now pollutes the main drainage canal, the south branch of the Chicago river, the Desplaines river, and the Illinois river, the stock yards slip and Bubbly creek, and that which will pollute the Calumet-sag channel when constructed. Also that immediate steps be taken to acquire the necessary land and right of way for constructing intercepting sewers along Desplaines river to receive the sewage of the villages of Maywood, River Forest, Forest Park, and other nearby municipalities, and for a treatment plant for treating the sewage so collected. It recommends that domestic sewage coming from an area of approximately twenty-two square miles and centering in the 30th Street pumping station be treated by settling basins, or by the activated sludge treatment or such other processes as may be designated by the chief engineer, and that land for this be acquired as promptly as possible, as well as for treating sewage diverted through the Calumet-sag intercepting sewer. Other local conditions also are considered, such as local nuisances now existing along the north branch of the Chicago river and emanating chiefly from the city of Evanston, for extending to the main channel the sewers which now discharge into the Ogden ditch, and some other minor matters.

The construction of these works for treating the sewage will not in any way diminish the return from the money already spent in constructing the drainage canal, since the dilution which will still be afforded by this canal will serve as a finishing process to the preliminary treatment which will be given the sewage, and will thus reduce the extent and cost of such treatment below that which

would have been required had not this dilution been available. There is no question in the minds of those who are familiar with the conditions in Chicago that some action of this kind will shortly be imperatively required, and that the necessity for it is rapidly becoming more apparent; and that definite action must be taken at once if serious nuisances are not to develop along the several water courses named, and if deposits in considerable amounts are not to be made in the canal and rivers, the removal of which would add considerable expense to the operation of the present drainage system.

#### HORSE CARS IN NEW YORK.

New York has for many years been subject to various witticisms connected with the fact that it is one of the few places in the country where the old-fashioned horse-car can still be found operating in the streets. All of these lines have been put out of operation, however, except one, and the New York Railways Company has assured the Public Service Commission that the last horse-car will be removed from the island of Manhattan before April 1st, 1917.

As was the case with the other lines which were until recently used for horse-cars, the horse-cars on this line will be replaced by storage battery cars. In fact, it has been chiefly the difficulty of securing practicable and economical storage battery operation of street cars that has delayed thus long the removal of the antiquated horse-car. New York has consistently and persistently adhered to the policy of allowing no trolley wires in the streets of Manhattan Borough, and this has not only been the reason of the long continuance of the use of horses, but also has resulted in the practical development of the underground trolley, and now of the storage battery, as methods of operating street cars.

#### A. S. M. I. SHEET ASPHALT SPECIFICATIONS.

Chicago, Nov. 23, 1916.

Editor Municipal Journal, New York City, N. Y.

Dear Sir—May I be permitted a few words of comment upon the letter of Mr. Francis P. Smith in your issue of November 9th replying to a letter by Mr. Daniel T. Pierce published October 26th?

Mr. Smith says that Mr. Pierce's letter was published under a misleading caption ("Wide Open or Alternate Specifications"), since the A. S. M. I. asphalt specifications and those offered by me at the Newark convention were "identical so far as the asphalts admitted under them are concerned." Mr. Smith fails to show, however, that while the requirements in these two specifications were alike with respect to the tests provided for, they were totally different in that there were separate provisions for cements to be made with natural solid asphalt and with residual asphalts.

As to Mr. Smith's contention that if we have two classifications of asphalt we should, logically, have "more than five separate classes," it seems only necessary to say that everyone knows that there are but two main groups of asphalt, namely those found in nature as solids and those derived from petroleum. To go further than this classification is unnecessary, in my opinion, although other committees of the A. S. M. I. have made as many as five classifications of bituminous materials and so has at least one of our large cities. Incidentally it may be mentioned that in the case of three classes of materials, the A. S. M. I. has already adopted alternate or separate specifications. The wood-block saturation specifications adopted at Newark were of this description.

Mr. Smith refers to the statement made by Mr. Pierce that it is "unfortunate that this subject should have been so often discussed from the viewpoint of the interest of one class of asphalt producers or the other." But it appears to the writer that Mr. Smith has himself fallen into this error. At least he does not attempt to controvert a single one of the arguments in favor of alternate asphalt specifications from the viewpoint of public interest.

Finally, since so many members appeared to misunderstand the situation, I wish to say that the alternate specifica-

tions proposed by me were submitted to the asphalt committee on the Monday preceding Thursday of the convention week. The committee, headed by Mr. Smith, chose to ignore the whole matter and there was therefore no recourse but to bring it up on the floor of the convention.

Very truly yours,

WALTER H. FLOOD,  
Consulting Chemical Engineer.

#### TAR BINDER COAT FOR BLOCK PAVEMENTS.

A suggestion for a substitute for a sand cushion where one of the various block pavements is used is made in the part of Mr. Harding's letter quoted below. This method has been used for years in the case of wood blocks, more abroad than in this country. For brick, and especially for stone block, however, it seems to us to be impracticable, for the reason that the variations in the depth of the former run up to a quarter-inch, and of the latter to a half-inch, while the surface of the concrete base generally has variations of surface of equal amounts; from which it would result that the thickness of the tar coat would vary one-half inch to an inch under the different blocks; and in warm weather the tar, if suitable for binding purposes, would become sufficiently soft to yield under the pressure of wheel loads, permitting the shallower blocks to settle out of surface.

Possibly we are mistaken in the ideas expressed above and if any one should know of tests of the method which have been or in future may be made, we would be glad to learn of and publish the results.

Editor Municipal Journal,  
50 Union Square, New York City.

Dear Sir:

Recently I have read about the repairing of worn-out concrete roads by covering the old concrete with tar and applying a reinforced concrete surface thereon, and the fact that the top concrete was so thoroughly tied to the old concrete by the tar that this division surface was not the weakest portion of the combination leads me to make the suggestion that possibly the next step in advance in laying block pavements will be the concrete foundation with a surface smooth and parallel to the finished surface, this surface painted with some bituminous material and the brick or block rolled into it and then the joints filled and the surface covered with bituminous material. Such a pavement, particularly the brick, would withstand much better the heavy auto traffic and enjoy the resilience which has been considered so necessary, besides being easily maintained with a tar surface treatment.

Yours very truly,

ROBERT J. HARDING.

#### STREET CLEANING DATA.

The following data are supplementary to those published last week having been omitted for lack of room.

Brooms.—The life of the broom of a machine sweeper is given as from 6 to 90 days; the average of the reports from forty-two cities being 22½ days. Of these cities, five report less than 10 days; sixteen between 10 and 19 days, fifteen between 20 and 30 days, and six more than 30 days. Most of the cities refill their own brooms when worn out. The average number of days per year the machine sweepers work is reported as 270, which would give an average of twelve fillings of a broom a year. Most of the cities report that the rapidity of wear varies with the roughness of the pavement swept.

The sixty-seven cities reporting on these items gave the following as the total numbers of appliances in service: Hand brooms, 8,363; horse-drawn machine brooms, 395; motor-driven machine brooms, 15; horse-drawn flushing machines, 229; motor-driven flushing machines, 23; horse-drawn sprinkling wagons, 624; motor-driven sprinkling wagons, 12; squeegees, 81; collecting carts or wagons, 3,414.

# The WEEK'S NEWS

State Highway Progress in Indiana and Wisconsin—Testing Road Resistance—Sanitary Surveys in Newark, N. J., and Birmingham, Ala.—Child Hygiene Work in the Country—Condemn Big Montreal Aqueduct Project—Control of Sprinklers—Fires in Roscoe, N. Y., San Antonio, Tex., Ithaca, N. Y., and Salt Lake City, Utah—New Auto Apparatus—More Trouble in Hibbing—City Engineer and Manager Clash—Solving the Garbage Problem in Bridgeport, Toledo and Lansing—Rapid Transit for Chicago and Pittsburgh—Bayonne's Terminal Plans.

## ROADS AND PAVEMENTS

### Plan Formation of Indiana Highway Commission.

Hartford City, Ind.—A bill to be presented at the next meeting of the legislature, providing for a state highway commission, is being drafted under the direction of A. B. Lupton of Hartford City, president of the Hoosier State Automobile association. Among the proposed provisions of the bill are that the highway commission will be composed of three members, appointed by the governor, and a state engineer to serve as long as his work is satisfactory and that the state shall give aid in the construction of roads on a fifty per cent basis, helping construct only those highways forming a connecting series of roads. When the bill is completed a meeting of motorists and others interested in the success of the measure will be held in Indianapolis to discuss changes.

### New \$4,000,000 Bridge.

Cleveland, O.—The accompanying illustration shows a view of Cleveland's new \$4,000,000 high level bridge, claimed to be the longest double-decked three-hinged steel span bridge in the world—591 feet long. It connects the west side of Cleveland with the downtown business section. Work on this improvement was started in 1912, and while the upper deck is about ready for vehicles and pedestrians, County Engineer Zesiger estimates that the east and west subway approaches will not be opened for trolley traffic before the latter part of 1917. Forty-four White auto trucks worked for eight different contractors or building material companies and handled over 60 per cent of the materials. This quantity included 543,000 sacks of cement, 62,692 tons of sand and 108,900 cubic yards of mixed concrete.

### To Test Road Resistances.

Madison, Wis.—Arrangements have been made by the Good Roads association of Wisconsin whereby a number of interesting tests will be made to determine the tractive resistance on roads of different types in good and bad condition to the pulling power of a team of horses. Further tests will be made of the gasoline consumption on roads in good and bad condition. These tests will be made under the auspices of the University of Wisconsin by Prof. F. M.

White, of the department of agricultural engineering. The first test will be made in Milwaukee county on the concrete roads in view of the large mileage of those roads in that county and the opportunity offered. In addition, gravel roads in that and adjoining counties will be utilized for the test and sand and dirt roads in other counties in the state. A most interesting test will be made in Dane county with horse drawn traffic. Roads of different types will be selected and a fixed load of agricultural products, probably 2,000 pounds, will be used in dynamometer determinations of the tractive resistance, indicated by the pulling power of a team of horses.

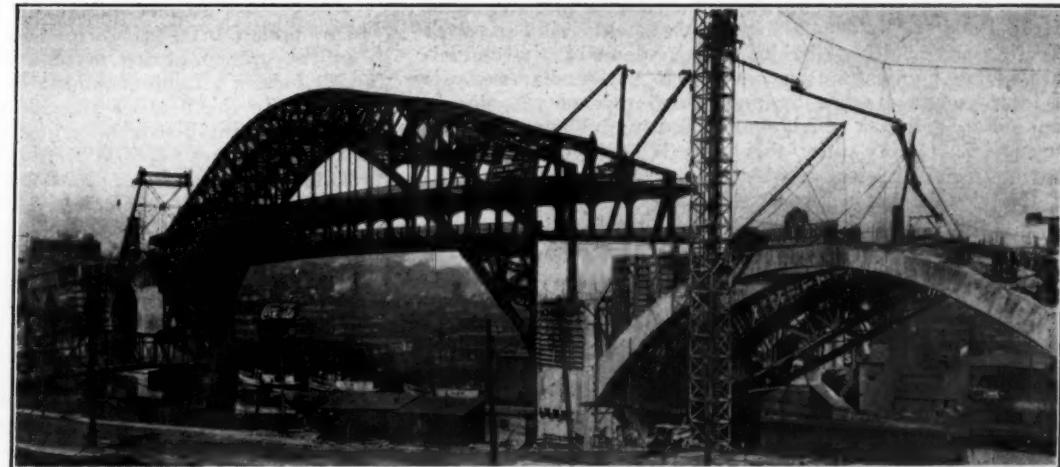
### No Assessment for Re-Paving.

Pottsville, Pa.—A decision of Justice Kephart, of the state superior court, which will affect all third class cities of the state, is to the effect that property owners on a thoroughfare cannot be assessed pro-rata for the cost of laying a second pavement on that thoroughfare. The case was brought by property owners on Market street, Pottsville, who objected to the assessment for the paving of that street with wood block, which replaced the macadam laid many years ago. Justice Kephart pointed out that a jury in that county had declared that the character of the macadam was such that it was considered a pavement. The city of Pottsville therefore cannot collect from the property owners the price of a second pavement. The case has been hotly contested, as every third class city in the state is bound by the decision and a number of suits are pending on the same issue.

### State Road Construction in Wisconsin.

Madison, Wis.—A. R. Hirst, chief engineer of the state highway commission, states that during the present year 1,158 miles of state aid roads have been built at a cost of \$3,631,026. There are 352 state aid bridges built at a cost of \$540,068. Together the amount expended by the state during the season now closing totals \$4,171,094, which is about the same amount as spent last year for the same purpose. The mileage added during last summer and now being completed gives Wisconsin a total of 4,850 miles of state aid highways built during the past five years the highway commission has been in existence. During the coming year it is expected that 1,300 miles will be added to this total as there will be some \$4,500,000 available for

WORK ON  
CLEVELAND'S NEW  
\$4,000,000 HIGH  
LEVEL BRIDGE.



this purpose, according to Mr. Hirst. Of the 1,158 miles of road built this year, about 35 per cent was graded only and not surfaced. There is added 215 miles of stone and macadam road; 59 miles of concrete road; 102 miles of clay and stone road and about 300 miles of crushed gravel and pit run gravel roads.

## SEWERAGE AND SANITATION

### Health Department Makes Sanitary Survey.

Newark, N. J.—A sanitary survey of the city projected by health officer Craster, which was interrupted by the outbreak of the infantile paralysis epidemic, is to be resumed and completed. The survey was begun following the revelations made by a social and sanitary survey of a congested ward by the principal newspaper of the city. The results of the work by the health department confirmed the newspaper investigation and the whole city is now to be thoroughly surveyed by a house to house inspection. For this purpose the eighteen sanitary inspectors are divided into three squads. A record will be made of each house which will serve as a permanent history. In three months in the first ward investigated, 15,155 sanitary inspections were made and 3,258 nuisances found; of 2,983 yards inspected, 622 were found insanitary; 569 insanitary cellars out of a total of 2,645 inspected and of these 24 were found unfit for habitation; 7,567 rooms were inspected and of these 234 were found insanitary, 425 windowless, 2,137 poorly ventilated and 454 poorly lighted; 114 insanitary streets were reported.

### Typhoid Epidemic Traced to Leaking Reservoir.

Bluffton, Ind.—Seepage from the ground into a city reservoir has been advanced as the cause for the epidemic of typhoid fever in Bluffton and Wells county. Dr. H. H. Mitchell, of the state board of health, who has been investigating the epidemic, discovered that the reservoir was unlined and that filth from surrounding residences polluted the city water supply. The engineering department of the board of health will take action in the matter. There were 111 cases reported in the city and county and it is believed that many cases have not yet been reported.

### Legislators' Drinking Water Found Impure.

Lansing, Mich.—For several years drinking water used by members of the legislature and members of the supreme court, has been imported from Mt. Clemens, as the members of the legislature objected to the Lansing water. During the legislative session the water bill amounts to \$20 per day. Now dairy and food commissioner Helme, whose chemist has made an analysis of the water, announces that it is contaminated. According to Helme, every sample taken from the sterilized bottles and from the wells, indicated colo bacilli and contamination by sewage. As a result of his investigation commissioner Helme has notified the Mt. Clemens agent that further sales of the water within the state is prohibited as long as its present condition continues.

### Child Hygiene Work in Cities.

Washington, D. C.—Of the 599 American cities with 10,000 or more population, over two-thirds have reported to the Federal Children's Bureau that some kind of work affecting the health of babies is carried on by the municipality from public funds, according to the tabular analysis of infant welfare work by public and private agencies in the United States, which was recently published by the bureau. In twenty cities this work is so highly organized that a special division devoted to child hygiene is included in the city health department. Cities of every type are found among those reporting special municipal health work for babies. In general it appears that municipal work is more highly developed in large cities than in small, although two cities with less than 100,000 population, Duluth, Minn., and Montclair, N. J., are found among the twenty having a municipal division of child hygiene. The others are Boston, Mass.; Buffalo, N. Y.; Chicago, Ill.; Cincinnati, O.; Cleveland, O.; Detroit, Mich.; Jersey City, N. J.; Kansas City, Mo.; Los Angeles, Cal.; Milwaukee, Wis.; Nashville, Tenn.; New York, N. Y.; Newark, N. J.; Philadelphia, Pa.; Pittsburgh, Pa.; Providence, R. I.; Seattle,

Wash.; Toledo, O. Babies and mothers are helped by the municipalities in various ways. While 255 cities report milk inspection as the only municipal activity directly affecting babies, 100 municipalities employ a nurse to visit the homes and teach the mother what to do for her baby, and to help her when the baby is sick. Special municipal nurses are assigned in sixty-three cities to the care and instruction of prospective mothers. In sixty cities infant-welfare stations are maintained with doctors in attendance, and mothers bring their babies for weighing and examination and advice about feeding and general care. Many cities have both infant-welfare stations and visiting nurses. Classes for instructing older school girls in infant hygiene are conducted by forty-four municipalities. Many state departments of health and extension divisions of state universities also report extensive educational work in child hygiene, such as lending exhibits, lantern slides and films, distributing pamphlets and sending out lecturers, maintaining a regular press service and conducting a special campaign for complete birth registration. Kansas, New Jersey, New York and Ohio have organized special divisions of child hygiene within the state departments of health. In Massachusetts infant-welfare work is a well defined feature of the work of the division of hygiene.

### Compulsory Vaccination Upheld.

Frankfort, Ky.—The authority of county boards of health "when there is reasonable apprehension of the outbreak of a communicable disease, such as smallpox, to take such action as may be necessary in order to stamp out the disease and prevent its spreading" has been upheld by chief justice Miller. He dissolved an injunction granted by the Henry Circuit Court, restraining the county board of health and county health officer from further prosecuting principal B. F. Hill, of the Bethlehem graded school, and the chairman of the board of trustees for refusal to obey an order for compulsory vaccination of children attending the school. The board issued an order that no child should attend school until vaccinated. Principal Hill thought he had no right to enforce the order, as, he said, most of the people of the district are opposed to vaccination. He was backed up by the chairman of his board, and the county health officer swore out warrants for them. They secured affidavits of physicians that there had been no smallpox in the county for a year and none in the district for eight years. On the other hand were affidavits from physicians that there were outbreaks every spring and fall and that forty soldiers of a company of militia, who had been at Fort Thomas, where there was a case, had returned to the county, and the order was necessary to prevent an outbreak. Judge Miller said the county health board was justified by the circumstances and had ample authority to make such a rule and enforce it. He further said: "The legislature may, by express provision, in the exercise of its police power require or empower a local or administrative authority to require the vaccination of children as a condition of their being admitted to the public schools, although smallpox be not prevalent or its outbreak be not apprehended."

### Report by Health Expert.

Birmingham, Ala.—If Birmingham and Jefferson county adopt the unified health system, as recommended by Dr. Carroll Fox, a minimum annual expense of \$75,870 will be incurred. In the detailed report of the health situation in the Birmingham district the government health specialist has outlined a system that should make the present death rate of 6.5 per 1000 among the white and 14.58 per 1000 among the negroes even lower. The complete report contains 48 specific recommendations, and is prefaced by a statistical account of the health records in Birmingham and Jefferson county. Dr. Fox studied the administration and organization of health work. The water supply was pronounced very satisfactory. The disposal of sewage and the collection and disposal of garbage and rubbish, and milk and food inspection are fully discussed. At the head of the unified health system, if adopted, will be a full-time physician, specializing in preventive medicine. The health organization is to be divided into two sub-departments, one for the city and the other for Jefferson county. Both shall

be under the chief. One shall be concerned with the field activities of the county department, while the other shall perform similar duties for the city. Provision is made for the employment of a full-time sanitary engineer and a full-time bacteriologist. The county is to be divided into five districts, which shall each have a public health nurse and a sanitary inspector. The county must appropriate \$30,700 to be expended for a county health officer and assistant; sanitary engineer, clerk and registrar; five public health nurses; five sanitary inspectors and a bacteriologist and laboratory assistant. The city department is to be divided into four parts—a division of epidemiology, sanitation, milk and food inspection, and vital statistics. The city is to be divided into ten districts and each district is to have a public health nurse. The city is to appropriate \$45,000. This will be expended in defraying the expenses and salaries of the assistant health officer, registrar of vital statistics, clerk, chief sanitary inspector, seven assistant sanitary inspectors, chief of milk and food division, two assistant milk inspectors, two meat inspectors, two food inspectors and 10 public health nurses. A number of institutions, such as an infant welfare station and a tuberculosis dispensary, are provided for in the report.

#### Bond Issue to Pay for Poliomyelitis Work.

Holyoke, Mass.—The board of aldermen have passed a loan order for \$80,000, to be known as "epidemic emergency gold bonds." This money will meet the expenses of the fight during the poliomyelitis epidemic in the city. It was at first supposed that \$60,000 would be enough to pay the bills, but the city auditor finds that \$20,000 more will be required before the epidemic account has been finally adjusted. The bonds will be for a term of five years.

## WATER SUPPLY

#### The Cincinnati Waterworks.

Cincinnati, O.—Superintendent Hiller's annual report for the water works shows expansion of municipal service to meet the demands of a rapidly growing city. More than 419,000 people depended on the plant and they consumed a total of 17,796,328,605 gallons of water. The average daily consumption was 48,757,065 gallons, 118.9 gallons per capita. Abandonment of the old small mains in the congested district and the substitution of larger mains is urged to service director Hornberger. During the year more than thirty miles of mains were added to the distribution system. More than sixteen miles of mains were cleaned. The continuous rainfalls of last year are reported to have decreased the revenues of the department more than \$45,000.

#### Montreal's \$10,000,000 Aqueduct Condemned.

Montreal, Can.—That the city's aqueduct project will require a total expenditure of between \$10,000,000 and \$12,000,000, that the project was not studied or planned properly and that the city could annually save \$262,000 by abandoning the scheme and purchasing the 7,000 h. p. it was proposed to develop with the aqueduct, are the important charges made by a report of seven prominent engineers who investigated the project. Thirty-one rate-paying Montreal engineers, all members of the Canadian Society of Civil Engineers, after the Board of Control had refused to pay for an independent investigation of the scheme, appointed a committee of seven independent consulting engineers of high standing, consisting of W. F. Tye, chairman, Sir John Kennedy, Ernest Marceau, R. A. Ross, J. A. Jamieson, Arthur Surveyer and Walter J. Francis. The principal points brought out in the report are:

The capacity of the original aqueduct was sufficient for three times the present population served, if used for water supply only and not for hydraulic power.

The cost of the construction of a filtration plant was the only further capital expenditure necessary to make the water from the original aqueduct ideal both for domestic and industrial use.

With the exception of the filtration plant and the pumping equipment all expenditures in connection with the present project are chargeable to power development.

The power project cannot be regarded as an essential part of a general improvement scheme, because boulevards, parkways, permanent bridges and so forth were just as applicable to the original aqueduct as they are to the present development.

The present project has never been properly studied or reported upon as a whole.

The project as designed would not safely develop under the best

conditions more than 7,000 horse-power at any time of the year, and the average output would be actually much less than this.

Serious operating troubles due to frazil and other ice are inevitable. These will greatly reduce the maximum output below 7,000 horse-power and may cause complete stoppage of the plant during a more or less protracted period every winter.

The minimum capital cost of the project as designed will be \$10,600,000. This cost is exclusive of the filtration works or any pumping plant or steam auxiliary plant, or the Cook Construction Company's claims of over \$900,000, or an allowance for parking, or the usual allowance for contingencies.

Radical changes in design at greatly increased cost would be necessary to even approximate the capacity of the power development as claimed by the city.

The minimum capital cost based on the maximum safe capacity of the plant as designed will be \$1,515 per horse-power.

The minimum fixed charges and operating expenses for the power plant will amount to \$757,000 per annum.

The minimum fixed charges and operating expenses of the power plant will be \$108 per horse-power per annum.

Twenty-four hour power can readily be purchased in the open market at a figure not exceeding \$25 per horsepower per annum, and twenty-hour power suitable for pumping for not more than \$20.

The yearly cost of purchasing the 7,000 horsepower, which is the maximum amount of power that the project might develop, would not exceed \$150,000.

As compared with the purchase of power this project, if and when completed, would involve a loss of at least \$600,000 per annum.

The present project should never have been started, and we are firmly of the opinion that all thought of completing it, along the present lines, should be abandoned.

If all work were to be stopped at once, the total capital cost to the city would be about \$5,200,000, which includes an allowance of \$300,000 for boulevards, bridges, fencing and cleaning up, but no allowance for the claims of the Cook Construction Company.

The annual fixed charges on this amount of \$5,200,000 will be \$345,000.

The total yearly cost of 7,000 horsepower purchased, plus the fixed charges on \$5,200,000 would be \$495,000.

The total capital cost which will be saved by abandoning the present project will be a minimum of \$5,400,000.

The total annual saving to the city by immediately abandoning the present project and purchasing 7,000 horsepower would be a minimum of \$262,000.

By judicious adaptation of the existing conditions, a limited return may be derived from the expenditures already incurred.

#### Pitometer Finds More Leaks.

Syracuse, N. Y.—Another large leak in the city water distribution system has been found by the pitometer survey, making three located within a week. The measurements showed that 116,000 gallons of water were being wasted every twenty-four hours through this new-found leak. This makes a total loss of 296,000 gallons daily from the three leaks. The opening was at a joint in the high pressure main. The main was below and but a short distance from a sewer. The stream washed away the earth from beneath the sewer, causing it to settle and a joint in the pipe to open. The water rose to the opening in the sewer pipe and ran off. There was no surface indication of the leak. Since the survey was started, under supervision of superintendent C. A. Windholz, leaks from which there was a daily loss of over 2,050,000 gallons of water have been located and stopped. These include only leaks from which 5,000 or more gallons escaped each twenty-four hours.

## STREET LIGHTING AND POWER

#### Domestic Gas Supply Most Important.

Iola, Kans.—Natural gas furnished by a common carrier must be delivered to domestic consumers in preference to all others, Judge Oscar Foust decided in the district court here. He denied an injunction asked by the Iola Portland Cement Company against the Wichita Pipeline Company, owned by the Henry L. Doherty interests, prohibiting the latter from reducing below the contract minimum the supply furnished the petitioner. The city's contract called for all available gas, in case the supply to domestic consumers fell off.

#### Bonds for Municipal Gas Plant.

Bellefontaine, O.—Bonds in the sum of \$45,000 will be issued by the city to build a new gas plant for the manufacture of artificial gas, which, it is estimated, is used in 80 per cent. of the homes here for cooking.

#### Erie's Conduit.

Erie, Pa.—The recommendations of G. E. A. Fairley, of Baltimore, the expert employed by the city to investigate the problem of proper utilization by the private utility companies of the city's conduit, have been accepted by all and are now being worked into plans by city electrician Crane. Work will be begun as soon as all parties agree as to details. The city had built the conduit, but the companies had found it inadequate. Mr. Fairley recommended that all

manholes and distributing manholes should be rebuilt where service use demanded; there should be dividing barriers in main and distributing manholes; that the conduits on State street should be occupied in such manner that each company receive a fair and equal division of duct space; that street railway feeder cable, when installed, shall be allowed right of way through either of the lighting companies' main manhole allotment, using by preference the side of the street containing the greatest number of unoccupied duct lines. The reconstruction of the manholes is necessitated by the difficult situation in which seven different cables and distributing services come together in one manhole. The cost of the work will be about \$25,000.

#### Lower Rates for Municipal Plant.

Alameda, Cal.—The electricity commission has reduced the commercial lighting rates of the Alameda municipal plant, the schedule ranging from five to two cents per kilowatt. The commission has also reduced the cooking schedule to three cents per kilowatt. The city council has confirmed the new rates.

#### City Competition Forces Company Rate Cut.

Lincoln, Neb.—The private electric light companies of this city have announced another cut in rates to meet the competition of the municipal plant. Before the city appropriated \$60,000 to erect a plant consumers were paying as high as 13 and 15 cents a kilowatt hour. The first cut of the private companies was to 5 cents a kilowatt hour and now it is 3 cents where the maximum amount of current is used. This is the same as the city's rate. "The city's outlay has saved the people not less than \$100,000 in the last two years on their light bills," estimates Paul Doerr, assistant superintendent of the municipal plant, "and it is impossible to estimate the total saving represented by the cut of the two private companies to meet the city's competition."

#### Question Validity of City's Lighting Contracts.

Cleveland, O.—Contracts of thousands of Cleveland residents with the municipal light plant may be regarded as illegal if a plea entered in municipal court by the Tropical Paint & Oil Co. is sustained by the courts. In August the company was sued by the city, which maintained that when the company terminated its five-year contract for current some months ago, it should have paid to the city \$256.23 as a result of the "penalty clause" in the contract. Objecting to this payment, the company declared: That the rates for current are unequal, unjust and unreasonable; and are invalid and illegal because they are not fixed by ordinance, as required by the Ohio constitution; the board of control is without authority to fix rates, which must be established by legislation, the rate ordinance being subject to the approval of the electors if a demand for referendum is made; the contract is invalid because it lacks mutuality, laying down penalties for the current user, but exempting the city from liability for interruptions in furnishing current; interruptions in current occurred to detriment of company's business.

## FIRE AND POLICE

#### Fire Commissioner Loses Sprinkler Control.

New York, N. Y.—An appeal from an order of the fire commissioner directing the installation of automatic sprinklers has been sustained by the Board of Appeals. Ex-assistant corporation counsel Alexander C. MacNulty, who appeared for the appellants, said that the decision is of far-reaching importance. He argued that the fire commissioner's discretionary power to order the installation of automatic sprinklers, which was sustained by the Court of Appeals, had been superseded by an ordinance which required the fire commissioner to make and publish definite rules and regulations concerning the requirement of sprinklers and other fire-extinguishing appliances. J. O. Hammitt, who represented the fire commissioner, admitted that no rules and regulations had been made because the commissioner had not understood that it was the purpose of the ordinance to deprive him of the discretionary powers

which he had formerly exercised. The ordinance expressly provided that its provisions should not become effective for ninety days after the adoption of the ordinance, a delay intended to afford the commissioner opportunity to make and publish the required rules and regulations. MacNulty said that he had demonstrated that under the Lockwood-Ellenbogen law the powers conferred by the ordinance upon the fire commissioner had been automatically transferred to the Board of Standards and Appeals. The date of the transfer was Oct. 1, 1916, and as the board had not yet made and promulgated regulations concerning the requirements of automatic sprinklers, the fire commissioner had no authority, at this time, to issue orders for the installation of sprinklers. In the decision all members of the board concurred, with the exception of chief Kenlon, of the fire department.

#### Entire Business Section Destroyed.

Roscoe, N. Y.—An early morning fire which started in a bowling alley swept the village, a summer resort in Sullivan county, and was not stopped until the entire business section was wiped out. More than a dozen buildings and residences were destroyed, much property was stolen in the confusion and the total fire loss was \$250,000. Only one woman was hurt in the blaze. The flames were finally gotten under control with the aid of fire companies from Liberty and Livingston Manor.

#### Six Firemen Hurt in Ladder Smash.

San Antonio, Tex.—Six firemen were injured, one probably fatally, when an extension ladder broke during an early morning fire in a residence. The injured men are John H. Buckholdt, F. M. Mills, H. Diehl, B. L. Beck, Emilio Medina and O. W. Short.

#### Facing Death Plunge, Fire Driver Holds Seat.

New York, N. Y.—Although his plunging horses were heading straight for the New York Central Railroad cut, Louis T. Taylor, a young fireman, driving a tender responding to an alarm, kept his seat and fell with team and vehicle twenty-five feet down on the tracks below. Both horses were killed, and he was terribly injured. The tender was following engine 88 to a fire when Taylor shouted to firemen Edward Roth and Joseph Laracy on the rear to jump, as the collar on one of the horses had broken and he had lost control of them. The men did not jump then, and it was not until the horses headed straight for the five-foot railing at the edge of the New York Central cut that they leaped. With Taylor sticking to his seat until it was too late, the team smashed into the fencing, bringing down fifteen feet of it, and the whole mass went over the side. The force of the impact against the iron guard rail burst the straps which held Taylor to his seat and he was flung clear of the debris and landed on the farther tracks. He was picked up unconscious and rushed to the hospital suffering from several broken ribs, fractured left leg, and internal injuries. It was thought at first that he would die but reports indicate that he will recover.

#### Big Salt Plant Destroyed.

Ithaca, N. Y.—The Remington Salt Company plant, on the shore of Cayuga Lake, said to be one of the largest of its kind in the world, was destroyed by a spectacular fire with a property loss estimated at \$350,000. The \$150,000 power house of the Central New York Southern Railway, adjoining, which furnishes power for the city street lighting and trolley services, escaped. The fire, however, caused the temporary abandonment of the power plant and the city was thrown into darkness and trolley service tied up. The fire, which was one of the most disastrous in the history of the city, was seen for miles, and 15,000 persons from Ithaca and nearby villages were attracted to the scene of the blaze. A half hour before the building was a mass of flames a watchman going the rounds had seen no indication. The cause is unknown. The plant was equipped with a small fire fighting equipment but this was located within the blazing structure. There are no hydrants within a mile of the scene so that the Ithaca firemen had a hard fight with the flames. With no chance of saving any portion of the wooden salt plant structure the firemen turned their attention to the electrical power plant, and succeeded in keeping

the flames from spreading. The two buildings were connected with a huge wooden shaft and this was burned while streams of water were being played at the power plant end. Another alarm was sounded from the East Hill district during the fire and several companies were recalled to the city on a needless run, someone having seen the glare of the first fire in the sky and sent in an alarm. The burned body of a laborer was found in the ruins.

#### Big Oil Blaze.

Salt Lake City, Utah.—The safety of practically the whole of the northwestern part of the city depended for several hours upon the outcome of a battle by city firemen at the Utah Oil Refinery company's plant. A blaze originating in the warehouse reduced the structure to ashes with a loss roughly estimated at \$75,000. While fifty firemen stood at the nozzles of a dozen lines of hose and faced the blistering heat, more than a million gallons of gasoline and oil were drained and pumped to emergency tanks outside the fire lines. Dozens of small steel gasoline tanks in the warehouse exploded by the heat were sent flying 200 feet in the air, sizzling masses of white hot and crumpled steel. Fragments of the tanks fell in a shower about the firemen, forcing them to battle with the flames under the shelter of larger tanks. The most frequent explosions were those of the small tanks, each containing fifty-four gallons, which were stored in the warehouse. The only hope of the firemen was to prevent the flames from spreading to other buildings. The warehouse was in the center of the oil works, necessitating a fight from all sides. Several streams of water were played continuously on the refining plant and ammonia tanks. The huge steel cylinder tanks containing thousands of gallons of various kinds of oil which surround the warehouse were protected from the intense heat by water and steam. Twenty thousand gallons in a large tank went up in flames when a hot piece of metal fell through a small hole in the lid of the tank.

### MOTOR VEHICLES

#### New Combination Purchased.

Frostburg, Md.—The fire department has placed an order for an American-La France combination engine and hose wagon to cost \$3,700. The machine is a "Brockway" type D, equipped with two 35 gallon chemical tanks and 1,200 feet of 2½-inch hose and two oxygen helmets, two electric torches, ladders, axes and other necessary appliances. The car will have a standard Continental fifty horsepower motor. The wheel base will be 148 inches and the car will be capable of making from thirty-five to forty miles per hour.

#### Municipal Garage Saves Money.

Houston, Tex.—After a trial of eighteen months the municipal garage is claimed to have resulted in a saving of \$5,000 annually on the upkeep of the thirty-three automobiles owned by the city. Those in charge say the saving would be even greater if heads of all city departments could be induced to send all automobile repair work to the city garage. The annual bill for maintenance of all city automobiles is now about \$15,000. Before the city garage was put in operation this bill reached \$20,000 and the number of city automobiles was then below the present number. The garage is conducted like a private institution and other city departments are charged for material used in automobile repair work and the time required for doing the work. Under this system the garage has shown a monthly profit of \$23 for each month of this year. Two men are employed in the garage. Their time is charged at the rate of 80 cents per hour. The big saving to the city does not come in the small monthly profit in the garage, but in the system of wholesale buying of automobile parts, tires and other accessories.

#### Triple Combination Does Well in Test.

Battle Creek, Mich.—A two-hour test was made on the city's new automobile driven triple combination pumping engine, chemical engine and hose car, which was made by the American La France Fire Engine Co. of Elmira, N. Y. The test was conducted by engineers of the Michigan Inspection Bureau at the request of the city officials. Suction was taken from a power canal. The pump was of

the gear rotary type, no valves; driven by a six-cylinder 5½-inch bore gasoline engine, rated by the manufacturers at 1,000 gallons per minute at 120 pounds pressure, 500 gallons at 200 pounds pressure and 400 gallons at 250 pounds pressure. In the first test the engine discharged an average of 1,102 gallons per minute at an average net engine pressure of 134 pounds per square inch, giving 4.6 per cent above rated capacity. In the second test the engine discharged an average of 205 pounds per square inch, giving 2.1 per cent above rated capacity. In the third test the engine discharged an average of 404 gallons per minute at an average net engine pressure of 255 pounds per square inch, giving ½ per cent above rated capacity.

#### New Engine in Service.

Klamath Falls, Ore.—The new city automobile fire engine has arrived, and has made its first run. It cost \$5,950. The machine is run by a 90-horsepower motor, and has a capacity of 250 gallons of water per minute.

### GOVERNMENT AND FINANCE

#### Hibbing Again.

Hibbing, Minn.—The strained relations between the village officials and the Oliver Iron Mining Company here again resulted in open hostilities. The day before bids were to have been opened for a \$350,000 municipal power and heating plant, the iron company obtained an injunction to prevent the village officials from taking any steps towards the erection of the plant. The fight is again over the alleged extravagance of the village officials and the company complaint again recites a long list of charges of wasteful expenditure and mismanagement. The company claims that the village lighting plant is already adequate and that the Great Northern Power Company, which supplies electricity to the Mesaba range communities is enlarging its plant. The temporary injunction also holds up payments on pavement warrants, work on the municipal slaughter house and other contracts.

#### Commission Form Defeated by Indifference.

Bridgeport, Conn.—The commission plan of government, which has been agitated for two years and endorsed by citizens of high standing, has failed of adoption after an aggressive advertising campaign. Out of a total registry of 21,700, only 6,603 voted, and as the laws require a sixty per cent vote at a special election, the plan was defeated by those who did not go to the polls. Those in favor numbered 5,764 and those against were 839. It is significant that 1,518 who went to the polls did not have a vote recorded. This is attributed to the fact that all levers were left open on the voting machines, so that proper voting was confusing. A large proportion of the unrecorded votes is blamed on many who had pledged themselves to those in charge of the campaign to "go to the polls" but who had not taken the trouble to vote when they got there. Both political parties are charged with having underhandedly worked to keep voters away. The Commission Government Union, through Chairman W. T. Hincks, announces that the campaign will be continued until a fair trial of strength is obtained.

#### City Loses Fight on State Taxation.

Detroit, Mich.—The supreme court at Lansing has issued a writ of mandamus against the city assessors of Detroit, compelling them to turn over to the state board of tax commissioners their books and tax rolls in order that the reviews of the assessments scheduled by the state board may proceed. The decision with its accompanying opinion is a complete victory for the state in a fight instigated by Detroit to escape an increase of nearly \$250,000,000 in its personal and real property valuations. The answer which the city assessors filed with the supreme court and upon which the city's attorneys argued contained many objections which the supreme court passes by as already well settled law. Particularly is this true of the contention that the state board, when the city charter of Detroit is taken into account, has no business with the city assessments, or in other words, that the state law is blocked as far as Detroit is concerned by the charter of the city itself.

The opinion of the court deals with the allegations of the assessors that the order for a review by the state board was defective because there was nothing in it to show that they had evidence of the omission of any property from the rolls, or that some individual was complaining of his assessment. In the absence of such evidence the assessors alleged that the only way the board could cause a review to be held was by an inspection made by themselves in which something wrong had been discovered. Such an inspection by the state board, it was admitted, was not made. Justice Stone says: "While the rolls are subject to the inspection of the board, the statute does not make it obligatory upon the board to make inspection thereof. A mere inspection of the rolls probably would not determine whether there was an improper assessment, but 'such investigation' as is mentioned in the preceding sections of the statute referred to would naturally tend to throw light upon the subject."

#### City Engineer or City Manager?

San Rafael, Cal.—A clash in authority between city manager Frank J. Boland and city engineer George L. Richardson is reported to have resulted in a tangle of San Rafael's municipal improvement affairs that threatens to prove costly to the Hutchinson Construction Company. The company has laid several blocks of street pavement, involving an outlay of approximately \$8,000, and cannot collect for its work. The law provides that the city engineer shall certify that improvements have been made in accordance with the plans and specifications. Boland, who is an engineer, had charge of the work and is ready to certify to it. Richardson had nothing to do with it and will not certify to anything except that he is the one and only bona fide city engineer of San Rafael. Four of the five councilmen are in favor of making Boland city engineer, but the charter provides that a city officer can be removed only by a unanimous vote of the board.

#### Municipal Budgets Required in Peru.

Lima, Peru.—The President of Peru has issued a decree requiring all municipalities to administer their finances in accordance with annual budgets. The decree specifies that in June of each year municipal councils shall prepare an estimate of expenditures for the calendar year. Following the discussion and adoption of budgets, they will be sent to the departmental board for approval. When approved the budgets will be printed in December of each year, and will be distributed to all officials concerned in the administration of the affairs of the municipalities.

### STREET CLEANING AND REFUSE DISPOSAL

#### Municipal Ash Collection for Bridgeport.

Bridgeport, Conn.—Collection of ashes by the city is to be instituted after the beginning of the new fiscal year next April. For years this has been favored by officials of the health department but because of the added expenses it has never been carried into effect. Now the city administration has approved it and the proposition will become effective. At the request of the mayor, the matter was brought before the board of health and Dr. Walter H. Brown, new head of the health department, was directed to make a preliminary survey of the cost of municipal collection of ashes, and of the methods and experiences of such systems in other cities of the size of Bridgeport. The actual work of collection will probably be in the charge of the department of public works.

#### Engineer Recommends City Garbage Plant.

Toledo, O.—Garbage collected in Toledo is earning three times its usual income for the Toledo Disposal Co., according to a report of W. G. Harmon, city sanitary engineer in charge of the Ten Mile creek sewer work. The large earnings of the disposal plant are due to the high price of fertilizer, the war and to the fact that no money is spent in repairs or abating the odors, Harmon says. The normal income of the plant, the report states, is about \$11,600 a year. Harmon has suggested disposal under municipal owner-

ship as a means of solving the city garbage question, instead of using garbage to fertilize the proposed workhouse farm. The sanitary engineer has based his estimates on the population of Toledo in 1950. There will then be 570,000 people in the city, he figures. The garbage collection will average 200 pounds a person yearly and figuring 310 working days means an average daily collection of 180 tons of garbage. To collect this amount and haul it to a disposal plant or the workhouse farm will cost about \$2.25 a ton for garbage and \$1.75 a ton for ashes, street sweeping and rubbish. Harmon says in 1950 it would require 390 acres of land annually to plow in the garbage collected. This land could not be used for three years and the report states that a farm of 1,170 acres would be necessary to take care of all the garbage collected, figuring 780 acres under cultivation each year. It would cost 50 cents a ton to plow in the garbage, he says. An incinerator large enough to burn all of the refuse and garbage in 1950 would cost \$1,200,000. At 60 cents a ton the annual operating cost would be \$223,000. The initial cost of a reduction plant would be \$360,000. The grease, fertilizer, glycerin, and other by-products taken from the garbage would net the city \$3.45 for each ton of garbage. It would cost \$55 a ton for operation. The income in 1950 from such a plant would amount to \$30,700, the engineer figures.

#### Begin Operation of City Piggery.

Lansing, Mich.—An experiment in a self-supporting city piggery as a method of garbage disposal, which is being started at the scavenger grounds west of the city, appears to promise a success, according to the officials interested in the venture. When the establishment of such a plant at city expense was found impossible on account of limited finances, mayor Reutter, city clerk McClellan and several aldermen became personally responsible for the initial expense of purchasing the hundred or more hogs now being fed there. Sheds and other equipment have been similarly provided and the pigs now on the place will probably be enough to handle the city's garbage during the winter. With the starting of furnaces many householders have chosen to burn garbage rather than pay the 10 cents a week for collection under the temporary system that will still be followed until next year's budget can provide the funds for municipal collection. All of the pigs have been inoculated by Dr. L. A. Wileden, city sanitary inspector, and Dr. C. F. Lynch, city health officer. Modern pens, scientifically constructed, and proper "housing conditions" for the animals were established under Dr. Lynch's direction.

### TRAFFIC AND TRANSPORTATION

#### Investigation of Chicago Transit.

Chicago, Ill.—Sixteen men in whose hands rests the solution of the traffic problem of Chicago, including the question as to whether or not the city shall have a subway, have completed an eight-day trip through the east to study the municipal traction system of four cities. Thirteen were aldermen, members of the city council committee on local transportation, seven of whom are also members of the railway terminals committee, and three were traction experts. Subways, surface lines, elevated roads, electrification of railroad terminals and prevention of traffic accidents are chief among the many problems which the party studied. The personnel of the party was Aldermen Thomas A. Doyle, O. Nance, Hiram Vanderbilt, Joseph H. Smith, Stanley S. Walkowiak, William J. Healy, Ellis Geiger, William Lipp, Oliver Watson, Albert J. Fisher, M. A. Michaelson, John Toman, Thomas J. Lynch, and Herbert Evans, secretary committee of local transportation, M. L. Cressey, assistant corporation counsel, assigned to traction matters, and O. H. Tousey, representing board of supervising engineers. Alderman Henry D. Capitain, chairman of the local transportation committee, and R. F. Kelker, transportation supervisor of the department of public service, joined the party in New York. Philadelphia was the first city to be visited and one day was spent. Four days were spent in New York, two in Boston, and one in Cleveland. Following the return of the party, conferences were begun with the three experts, William Bancroft Parsons, Robert Ridgeway and Bion J. Arnold,

regarding, among other subjects, the possibilities of a subway and the electrification of the suburban system of the Illinois Central Railroad.

With a few changes, the report of the experts will be finally submitted to council within a month, but in the main the recommendations have been consolidated. One of the recommendations is that the bore be built to run beneath the city hall and that a big unloading and transfer station be built in the vicinity of the municipal building. This will permit passengers transferring from one section of the city to another. The report among other things recommends that the entire sewerage and water system in the downtown district be rebuilt. This will call for special taxation, but the improvement had long been contemplated independent of the bore. Other recommendations include: A loop subway under the downtown business section which will connect the Van Buren and the Washington street tunnels, with branches running a considerable distance out on the West Side. Immediate and large extensions of the elevated roads are proposed in order to take care of long-distance travel and quickly relieve the strain on the surface lines. The consolidation of all elevated and surface lines, including the subways, into a single system, is urged. It is suggested that the present elevated roads be put into the combination at a capitalization of about \$75,000,000, the total capitalization of the consolidated elevated and surface lines to be in the neighborhood of \$230,000,000. The new private owning corporation in this plan to furnish new capital for extensions and improvements during the next nine years to an amount approximately \$250,000,000. The total capitalization of Chicago's completed elevated, surface and subway traction system at the end of nine years would be about \$500,000,000. The city's present traction fund of \$20,000,000 is to be spent in constructing subways, the title to which shall remain absolutely in the city. A small charge, perhaps 1 cent, is suggested for transfers from elevated to surface lines. The whole great work of building and reconstructing is to be done in three periods of three years each. In the first three years the extension of the elevated lines will be pushed, the plan being to develop to the utmost the facilities of elevated transit. During this period the initial subways will be under construction, and it is planned to have them ready for use at the end of the third year. The present elevated downtown loop, it is planned, will not be removed for at least three and possibly five years.

#### Beginning on Pittsburgh's Rapid Transit.

Pittsburgh, Pa.—The city council has finally confirmed the appointment of E. K. Morse as transit commissioner. He is to investigate the proposed building of a subway system at a salary of \$8,000 a year. Some objection was made to the appointment on the ground that Mr. Morse had once been engineer for the Pittsburgh Subway Company, but he convinced the city officials that he would not be biased against municipal ownership in his investigation.

#### Jitney Ordinance Upheld.

Asbury Park, N. J.—The ordinance passed by Asbury Park for the regulation of jitney traffic has been affirmed by the Supreme Court at Trenton in an opinion by Justice Swayze. The proceedings brought by Joseph West and others against the city were designed as a test case, not only of the Asbury Park ordinance, but of the Kates jitney law, under authority of which it was passed. The Supreme Court found only two open questions raised in the proceedings, these being whether Asbury Park had been authorized by the legislature to regulate jitneys, as provided in the ordinance, and whether the attempted regulation was so discriminatory as to deprive the owners of jitneys of the equal protection of the laws. The court held that full authority had been given to the city to justify the ordinance and that it was not discriminatory within the inhibition of the constitution. Disposing of other questions justice Swayze said the power of the legislature to authorize municipal corporations to regulate the use of the streets by vehicles, even to the extent of excluding vehicular traffic, has already been established. The power to regulate the use of streets by automobiles and motor vehicles has also been

settled by numerous decisions. The principal objections of the jitneymen were against the provisions of the law which require all operators of these vehicles to file \$5,000 bonds with the city against loss from liability or injury and death to passengers and enforce payment of 5 per cent of the gross receipts from each jitney as a monthly franchise tax to be used as revenue for city purposes.

#### Vote Bond Issue for Railroad.

Klamath Falls, Ore.—The city has voted in favor of amending the city charter to authorize and empower the council to buy, build, equip, maintain and operate railways and to fund indebtedness to carry out any one or more of these powers by issuing bonds to an aggregate amount of \$300,000. The vote stood 1,222 to 104. The bonds are for the purpose of assisting Robert E. Strahorn in the construction of the California, Oregon and Eastern Railroad. The vote cast in this election was the largest ever polled in Klamath Falls at any city election.

#### Jitney Law in Effect After Legal Fights.

Houston, Tex.—After a year of bickering, petitions and injunctions, the jitney bonding question has been settled. The Houston ordinance requiring a \$2,500 indemnity bond and \$9 quarterly license fee of each driver is now effective. The appeal of the jitneymen to the court of civil appeals at Galveston requesting a reversal of the decision of the district court which declared in favor of the ordinance has been dismissed at the motion of the jitneymen themselves. Similar ordinances in other cities in the state have been upheld by the higher courts. The Houston ordinance was passed last November and immediately met with the opposition of all the jitneymen, who secured an injunction against the enforcement of its provisions. The case was fought in the district court, lost by the jitneymen and appealed. The court suspended its decision until the appeal could be heard. Meantime the drivers prepared an initiative ordinance which provided for a mutual bonding company composed of the drivers. The ordinance was submitted to the people on August 26 and badly defeated. Since that time the jitney industry has rapidly lost ground in the city. Only 120 licenses have been issued for this quarter. The drivers have been paying a license fee of \$18 for this quarter, with the understanding that if they were required to make bond part of the money would be returned to them. It is understood that one company, which has the approval of the mayor, has promised to write the bonds for less than \$40 a quarter.

## MISCELLANEOUS

#### Plan Big Municipal Terminal.

Bayonne, N. J.—Along 2,800 feet of waterfront, where scows at present drawing a foot of water find difficulty in making dock, Bayonne is planning a system of railway and steamship terminals, freight depots and industrial plants at an expenditure of some \$7,235,000. Diagrams, specifications and architects' drawings have been submitted to the city commissioners by J. Spencer Smith, president of the New Jersey State Board of Commerce and Navigation. Benjamin F. Cresson, Jr., chief engineer of the board, and F. Van Z. Lane, engineer of the chamber of commerce, prepared the report. The commissioners have accepted and referred the report to a committee of the whole. Should it be approved, a bill will be drafted for presentation at the next session of the legislature, after which the matter will be laid before the people of Bayonne in the form of a referendum. It is expected that the bill will pass the legislature and that the referendum will be presented early in the spring. A campaign of education has been planned. By the terms of the plans presented 400 acres now under water will be reclaimed, which, added to twenty acres now above tidewater, will provide dockage for thirty modern freight steamships, as well as for smaller craft; a railroad yard with facilities for classifying and assembling freight, a ferry terminal for a Bayonne-Manhattan vehicular and passenger ferry, four miles of bulkhead platform, 1,350,000 square feet of one-story bulkhead sheds, 7,770,000 feet of two and three story bulkhead sheds, and more than 200 acres of land for

industrial buildings, together with trolley and highway connections, railroad sidings, and float bridges for railroad cars. The total estimated cost of the project is \$7,234,546, of which \$2,121,673 is for dredging, bulkheads and reclamation. The estimate provides for the interest on the cost during construction. A thirty-five-foot depth of water is contemplated, giving the city 20,300 lineal feet of deep water frontage, where at present docking by vessels of light draft is impracticable. The site of the proposed improvement is on the upper New York Bay frontage of the city. It is in an entirely undeveloped state and most of it is owned by the state of New Jersey. It is bounded by the National Docks railroad, having direct connection with practically every important railroad terminal on the Jersey side of the port of New York. The preparation of the plans and specifications came as the result of a conference held last winter by the Bayonne Chamber of Commerce, the city commissioners, the State Board of Commerce and Navigation and Irving T. Bush, president of the Bush Terminal Company of Brooklyn. An appropriation of \$5,000 to cover the cost of the preliminary engineering work was approved May 9 by the city commissioners.

#### Selection of Unskilled Labor in City Service.

St. Louis, Mo.—A new draft of rules of the Efficiency Board makes changes in the manner of selecting unskilled laborers for city work and in making promotions in all departments. Under them the eligible list of unskilled laborers, comprising 1,970 names obtained by examinations under the old rules will be abolished. Hereafter departments needing unskilled laborers will advertise for men to report at the job and the first to arrive will be put to work after a superficial examination as to physical ability. The following Monday night the workers will make application at the Efficiency Board and receive working cards to be turned over to their foreman. These cards will be filed with the Efficiency Board when the men are not working for the city, constituting an eligible list. Examinations for promotions to vacancies will be limited to the employees of the department in which the vacancy occurs. Skilled labor hereafter will be selected on a basis of experience, a grade of 70 per cent being allowed for three years' experience, providing application is accompanied by affidavit of former employers attesting ability. Three per cent addition will be allowed for each additional year until a grade of 100 is reached. The rules are to be submitted to city counselor Daves for his opinion as to their validity.

#### Utilities Commission Upheld in Telephone Case.

Coeur d'Alene, Ida.—An opinion returned several months ago by the Idaho public utilities commission in fixing rates to be charged for telephone service in Coeur d'Alene by the Interstate Utilities Company has been affirmed in a decision handed down by the state supreme court. In upholding the commission's action the court declared that under the provisions the public utilities act of 1913 the commission has full authority to prescribe rules and regulations for the performance of any service or the furnishing of any commodity supplied by a public utility. The commission held a hearing nearly a year ago when the city of Coeur d'Alene complained against alleged unreasonable charges made by the telephone company and against the telephone service given. The commission admitted the service was poor, but held that it would be improved after the installation of new apparatus, and refused to issue an order directed against the telephone company. The city of Coeur d'Alene then asked the supreme court to review the commission's findings. The discontinuance of what is termed the "four-party" line by the telephone company was one of the principal issues of the complaint made by the city. The commission declared the telephone company had the power to discontinue such a service in the interest of efficiency. The court sustained the commission, saying it was justified in returning such an opinion. It was held by the court that the commission did not exceed in its authority in accepting the evidence of the city as to the value of the telephone company's plant for rate-making purposes, declaring the commission's finding on that point should not be disturbed since it was supported by the evidence. The city had made a return of \$81,251.48 against the company's plant.

#### LEGAL NOTES

##### A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

###### Tax Bills—Equal Protection of Law."

Mullins v. Mt. St. Mary's Cemetery Assn. et al.—A cemetery company being for the purpose of assessment for sewer construction owner of all the land in the cemetery, notwithstanding sale of some of the lots for burial purposes, issuance of the special tax bills against the cemetery as an entirety does not deny the company equal protection of the laws, contrary to Const. U. S. Amend, 14.—Supreme Court of Missouri, Division N. 2, 187 S. W. R., 1169.

###### Contracts—Estoppel.

Mitchell v. Berlin-McNutt Co., et al.—A contractor for city construction work, undertaking to pay for assistance of every kind employed upon the work and for all materials purchased therefor, and to allow the city to withhold payment until satisfied that such materials, etc., had been paid for, and who himself accepted orders to the amount of his indebtedness to a subcontractor, in the absence of evidence that such orders were to be drawn on the particular fund retained by the city, was not estopped to claim it as against the subcontractor.—Supreme Court of Washington, 158 P. R., 264.

###### Assessments—Objections—Sufficiency.

Atkinson v. Webster City.—Objections to assessment for paving that it is unjust, inequitable, and largely in excess of benefits, that the improvements and assessment were not ordered as provided by law, that no valid contract was ever let, that it was not let to the lowest bidder on competitive bidding that the council allowed a change of bid after opening, that the improvement was not constructed according to specifications, and that the cost includes items not lawful and is excessive were sufficiently definite and specific.—Supreme Court of Iowa, 158 N. W. R., 473.

###### Governmental Duties—Nuisance.

Kea v. City of Dublin.—Although municipal authorities may have plenary power in the matter of collection, removal and disposition of garbage, yet they cannot lawfully create, in connection therewith, a nuisance dangerous to health or life; and where such a nuisance is created, and its effect is specially injurious to an individual by reason of its proximity to his home, he has a cause of action for damages. Bell v. Mayor, etc., of Savannah, 139 Ga. 298, 77 S. E. 165. Applying this ruling to the allegations of the petition, it set forth a cause of action and the court erred in dismissing it upon general demurrer.—Supreme Court of Georgia, 89 S. E. R., 484.

###### Officer's Services Outside of Duty—Compensation.

McGuire v. Prendergast, City Comptroller.—Under Greater New York Charter (Laws 1901, c. 466) § 1533, prohibiting any alderman or other officer of the corporation from becoming interested as contracting party or otherwise in the performance of any contract or work, the expense of which is payable from the city treasury, a visiting physician at the city prison, acting under the commissioner of correction and receiving an annual salary and having regular office hours, whose position was not specifically provided by law, and who had not taken the oath of office provided by Public Officer's Law (Consol. Laws, c. 47) § 10, nor the oath specified by section 1548 of the charter, who testified as an expert before commissioners appointed by judges of the Court of General Sessions to examine and report as to the sanity of defendants under indictment, who had pleaded insanity, might recover the fees fixed by such judges against the city, as such payment violated neither the letter nor the spirit of the charter, especially in view of the comptroller's course in making payments for such services.—Supreme Court, Special Term, New York County, 158 N. Y. S., 658.

## NEWS OF THE SOCIETIES

### Calendar of Meetings.

Dec. 5.—NATIONAL CIVIL SERVICE REFORM LEAGUE. Annual meeting, New Haven, Conn. Secretary, George T. Keyes, 79 Wall Street, New York City.

Dec. 5, 6.—PAVING BRICK INSTITUTE. Meeting, Statler Hotel, Cleveland, O. Secretary, Will P. Blair, Brotherhood of Locomotive Engineers Bldg., Cleveland, O.

Dec. 5-7.—AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. Annual meeting, St. Louis, Mo. Secretary, Joseph Hyde Pratt, Chapel Hill, N. C.

Dec. 5-8.—AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Annual meeting, New York, N. Y. Secretary, Calvin W. Rice, 29 West 39th Street, New York.

Dec. 7-9.—SAFETY FIRST FEDERATION OF AMERICA. Annual convention, Baltimore, Md. Executive Secretary, W. D. Heydecker, 6 East 39th Street, New York City.

Dec. 11-13.—PORTLAND CEMENT ASSOCIATION. Annual meeting, New York City. Assistant to General Manager, A. H. Ogle, Chicago, Ill.

Dec. 26-28.—SOCIETY OF AMERICAN BACTERIOLOGISTS. Annual meeting, New Haven, Conn. Secretary, Dr. A. Parker Hitchens, Glenolden, Pa.

Dec. 27-30.—AMERICAN ECONOMIC ASSOCIATION. Annual meeting, Columbus, Ohio. Secretary, A. A. Young, Ithaca, N. Y.

Dec. 27-30.—AMERICAN STATISTICAL ASSOCIATION. Annual meeting, Columbus, O. Secretary, Carroll W. Doten, 491 Boylston Street, Boston, Mass.

Dec. 28-31.—AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Annual meeting, New York City. Secretary, L. O. Howard, Smithsonian Institute, Washington, D. C.

Dec. 28-31.—AMERICAN POLITICAL SCIENCE ASSOCIATION. Annual meeting, Cincinnati, O. Secretary, Chester Lloyd Jones, University of Wisconsin, Madison, Wis.

Jan. 20, 1917.—WESTERN PAVING BRICK MANUFACTURERS' ASSOCIATION. Kansas City, Mo. Secretary, G. W. Thurston, 416 Dwight Bldg., Kansas City, Mo.

Jan. 23-25, 1917.—AMERICAN WOOD PRESERVERS' ASSOCIATION. Annual meeting, New York City. Secretary, F. J. Angier, B. & O. Mt. Royal Sta., Baltimore, Md.

Feb. 5-12, 1917.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau Street, New York City.

Feb. 7-15, 1917.—TENTH CHICAGO CEMENT SHOW, Coliseum, Chicago, Ill. Secretary, Blaine S. Smith, 210 South La Salle Street, Chicago.

Feb. 8-10, 1917.—AMERICAN CONCRETE INSTITUTE. Hotel La Salle, Chicago, Ill. Secretary, Harold D. Hynds, 1418 Walnut Street, Philadelphia, Pa.

Feb. 19-24, 1917.—SOUTHWESTERN CONCRETE ASSOCIATION. Annual meeting and concrete show, Convention Hall, Kansas City, Mo. Chairman, Show Committee, Chas. A. Stevenson, 1433 West 10th Street, Kansas City, Mo.

### SPRINGFIELD'S MUNICIPAL WEEK.

During Municipal Week, which was held in Springfield, Mass., November 20 to 25, with the purpose of bringing together all those who are interested in good municipal government, ten national, state and sectional organizations held their annual conventions. The list included the National Municipal League, Municipal Research Confer-

ence, City Managers' Association, Civic Secretaries Committee, Training School for Public Service, Intercollegiate Division of the National Municipal League, Western New England Chamber of Commerce, Massachusetts Federation of Planning Boards, Massachusetts Civic League, and Massachusetts Single Tax League.

### City Managers' Association.

The third annual convention of this association was held November 20 to 23 with headquarters at the Hotel Kimball. The actual work of the convention began, however, at nine o'clock Monday morning with an inspection of New York city municipal activities. Nine city managers from as many cities throughout the country were conducted about New York and shown the various undertakings of the city government. These men were: Henry M. Waite, Dayton; O. E. Carr, Niagara Falls; W. L. Miller, St. Augustine; H. G. Otis, Beaufort; S. C. Barnwell, Rock hill, S. C.; K. B. Ward, Sandusky; A. M. Field, Winchester, Va.; F. H. Scherer, Glencoe, Ill.; and J. J. Fitzgerald, Winnetka, Ill. After the round of the city's activities had been made, the city managers left for Springfield on the 11:15 p. m. train.

More city managers reported at Springfield Tuesday morning and there were about fifteen in attendance throughout the convention. A feature of the meetings of the association was the plan of having no set speeches. A topic was announced for each session and each member present was asked to give a three-minute account of his experience. After this the meeting was thrown open for general discussion. At the Tuesday morning meeting there was a roll call at which each city manager gave his name and address, and stated how long he had been city manager and what he did before becoming a city manager. This was followed by discussion on "Legal Difficulties in the Establishment of New Charters," at which the conclusion was reached that the city manager form of government can be established by subterfuge, but that it is desirable to have a special act of the legislature.

At the luncheon held at the Hotel Kimball at noon budgets were discussed with general reference as to whether or not they should cover sub-accounts, divisions and departments. Two main positions were held by two groups of city managers. One side advocated a certain degree of flexibility which would allow for variation in operating costs, and for unforeseen expenses. The others favored a rigid accounting for prospective expenditures, with the budget going into full details. The general idea was that in the smaller cities it was impossible to make the budget as rigid and as detailed as in the larger cities.

At the afternoon session the discussion was on the relation of politics and

the political dominance of the commission. Later the best methods of keeping cost record was discussed, and it was voted that the committee should prepare a uniform tabulation by which cities can have a comparative basis to work on in certain particulars. President Waite stated that in Dayton graphic forms of expense have been of great value. C. A. Bingham, of Norwood, Mass., spoke on the detail required to secure cost units. Mr. Waite advocated collective buying and urged that several towns band together for this purpose. The best method of getting proper publicity was next taken up. The main trouble along this line was evidently that some newspapers were partisan. Mr. Waite said that he found it valuable to allow reporters to see all the city mail and that this was kept in a basket a whole day for their inspection. At the dinner in the evening the discussion was on "What City Managers Can Do to Further Advance Good Government."

At the Wednesday forenoon session the advisability of giving publicity to bids, the problem of training understudies for city managers, and the best method of convincing the fire and police departments that there are no politics in the city manager form of government, were discussed. The principle of pure merit was considered the best way to accomplish the last. At the luncheon the attitude of the public toward the city manager form of government in the various cities was the subject under discussion. In the afternoon there was a general discussion on complaints and later each member was allowed five minutes to report the progress made last year, and to tell what improvements were attempted and failed, and why.

F. H. Clark, superintendent of streets and engineering of Springfield, gave an illustrated talk at the evening session, describing the public works of the city. Wm. E. Hodge, deputy superintendent in charge of the street lighting system, described the recently installed street lights of Springfield. He was followed by J. M. Switzer, city commissioner of Dayton, who spoke on the city manager form of government and by Morris L. Cooke, director of the utilities bureau of Philadelphia, who discussed "The City and Its Public Utilities."

At the final session of the convention held Thursday morning, O. E. Carr, of Niagara Falls, N. Y., was elected president to succeed Henry M. Waite, of Dayton. K. B. Ward, of Sandusky, was elected vice-president, and W. L. Miller, of St. Augustine, secretary-treasurer. Mr. Waite was appointed a committee of one to report on the standardization of forms for city record. The selection of a place for the next meeting was not settled, as the custom of holding a "Municipal Week" will probably be continued.

### National Municipal League.

The first meeting of the league was held Thursday morning at Hotel Kimball. A joint luncheon was held with the city managers at noon with Lawson

Purdy, president of the league, presiding. City managers and delegates in three-minute speeches discussed the most important accomplishments of their cities during the past year. In the afternoon F. E. Stacy, mayor of Springfield, delivered the address of welcome before the league. President Purdy responded, and his address on "Some Advanced Municipal Steps," was followed by the annual review given by Clinton Rogers Woodruff, secretary of the league, who spoke on "Municipal Preparedness."

At the Thursday evening session the general subject was "Political Parties in City Government; a Reconsideration of Old-View Points," and C. A. Beard, of Columbia University, W. D. Lightall, and John J. Murphy, led the discussion. Following this meeting was a smoker, given by the Springfield Board of Trade.

Reports of treasurer, council, nomination committee, and election of officers were scheduled for Friday morning. The following officers were elected:

Lawson Purdy of New York, was re-elected president of the league, and Meyer Lissner of Los Angeles, Cal., and Oliver McClintock of Pittsburgh, Pa., were added to the list of vice-presidents. Francis B. Sayre, Alfred Bettman of Cincinnati, O., Sam A.

Lewisohn of New York, William Bennett Munro of Cambridge, Mrs. V. E. Simkhovitch of New York, Thomas H. Reed of San Jose, Cal., Mrs. Bertha L. Friddy of Ypsilanti, Mich., and Charles A. Sumner of Kansas City, Mo., were added to the council. The other officers, all re-elected, are:

Vice-presidents, Miss Jane Addams of Chicago, John Stewart Bryan of Richmond, Va., Richard S. Childs of New York, Walter L. Fisher of Chicago, Frank J. Goodnow of Johns Hopkins University, A. Lawrence Lowell of Cambridge, George McAneny of New York, J. Horace McFarland of Harrisburg, Pa., Robert Treat Paine, of Boston, L. S. Rowe of Philadelphia, Charles Richardson of Philadelphia, Dudley Tibbitts of Troy, N. Y.; secretary, Clinton Rogers Woodruff of Philadelphia; treasurer, George Burnham, Jr., of Philadelphia; council Charles W. Andrews of Syracuse, N. Y., M. N. Baker of Montclair, N. J. W. P. Bancroft of Wilmington, Del., Charles J. Bonaparte of Baltimore, Md., John A. Butler of Milwaukee, Wis., Harvey Stuart Chase of Boston, Dwight F. Davis of St. Louis, Mo., George B. Dealey of Dallas, Texas; Albert DeSilver of Brooklyn, N. Y., C. O. Dustin of Springfield, Rev. William G. Elliot, Jr., of Portland, Ore., William Dudley Foulke of Richmond, Ind., C. J. France of Seattle, Wash., Clarence L. Harper of Philadelphia, Pa., Albert Bushnell Hart of Cambridge, Augustus

Raymond Hatton of Cleveland, Ohio, Herman G. James of Austin, Texas, Raymond V. Ingersoll of Brooklyn, N. Y., Camillus G. Kidder of Orange, N. J., W. D. Lighthall of Montreal, Knowlton Miker of Buffalo, N. Y., Frederick Cook Morehouse of Milwaukee, Wis., T. P. Newberry of Detroit, Mich., F. S. Spence of Toronto, Howard Strong of Minneapolis, Minn., H. A. Toulmin Jr., of Dayton, Ohio, Henry M. Waite of Dayton, Ohio, A. Leo Weil of Pittsburg, Pa., James H. Wolfe of Salt Lake City, Utah.

Throughout Friday and Saturday there were many papers and discussions, beginning Friday forenoon with the reports of the following committees: The Relation of the City to Its Food Supply, Professor C. L. King, chairman; Municipal Courts, Harry Olson, chairman; Committee on Civic Bibliography, Miss A. R. Hasse, chairman; New Sources of Municipal Revenue, Prof. R. M. Haig, Columbia University, chairman; Committee on Franchises, Delos F. Wilcox, chairman.

(Continued on page 600.)

## PERSONALS

Bryson, Carl W., for the past four years engineer of the city of Lima, has resigned his position and will leave Lima for Los Angeles, Cal., where he has been appointed chief of the Engineering Department of the O'Neill Oil Refining Syndicate, operating in the California field.

A. D. Jennings has been appointed chief of the Plainfield, N. J., fire department, succeeding T. O. Doane, resigned.

Townsend, Bessie M., has been appointed city comptroller of Atlantic City, N. J.

Woodruff, M. B., chief of police of Atlantic City, N. J., has been retired and Robert C. Miller, who has been acting chief, has been appointed to fill the vacancy.

The Pennsylvania State Highway Department announces that A. L. Crissinger has been appointed state highway superintendent of Beaver county, filling the vacancy caused by the removal of J. Henry Geer. It was also announced that H. H. Dorwart has been promoted from the superintendency of Jefferson county to the superintendency of Potter county, where he takes the place of J. W. Frazier, who has resigned to enter private business. The state highways in Jefferson county have been placed in the charge of A. B. Howard, who has been appointed a general foreman. The vacancy in the superintendency in this county will not be filled for the present. All of these appointments and promotions were effective Nov. 20.

The Washtenaw Engineering Company announces the opening of its offices at 408 First National Bank Building, Ann Arbor, Mich., for the general practice of engineering and surveying.

J. K. Looney has been elected road supervisor of Dallas County, Texas.

S. J. Humes has been elected county engineer of King County, Wash.

## PROBLEMS CITIES ARE STUDYING WITH EXPERTS

The township of Union, N. J., is to construct a SEWAGE DISPOSAL PLANT. The engineer for the work is Thomas F. Brown, East Rutherford, N. J.

Miami, Fla., is to construct CAUSEWAY to cost \$600,000. Plans and specifications have been prepared by Klyce & Kackley, consulting engineers, Miami, Fla.

Lima, O., is making a number of improvements to its WATERWORKS. The consulting engineers in charge of this work are R. Winthrop Pratt, Hippodrome Building, Cleveland, O., and Wm. G. Clark, Spitzer Building, Toledo, O.

In making a forty-mile ROAD improvement near Canton, Miss., the road commissioner of the Madison district had the plans and specifications prepared by Walter G. Kirkpatrick, engineer, 704 Farley Building, Birmingham, Ala.

Plans for an extensive TERMINAL DEVELOPMENT on the waterfront of Bayonne, N. J., to cost about \$7,235,000 have been completed by the consulting engineers, Benjamin F. Cresson, Jr., chief engineer of the New Jersey State Board of Commerce and Navigation, Trenton, N. J., and F. Van Z. Lane, engineer of the Chamber of Commerce, Bayonne. Conferences preceding

the preparation of the plans were advised by Irving T. Bush, president of the Bush Terminal Company, Brooklyn, N. Y.

A SEWERAGE SYSTEM and a SEWAGE DISPOSAL PLANT are to be constructed by the city of Sedan, Kan., from plans and specifications drawn up by the consulting engineers, E. T. Archer & Co., New England Building, Kansas City, Mo.

Lake Forest, Ill., has been considering the question of GARBAGE-DISPOSAL and has received the report on the problem of the consulting engineer, Samuel A. Greeley, of Pearse and Greeley, 64 West Randolph Street, Chicago, Ill.

Castlewood, S. D., is to construct a WATER SUPPLY SYSTEM. The engineers selected to prepare plans and specifications for the proposed work are Freed & Sours, Inc., Watertown, S. D.

Algona, Iowa, is to make a number of STREET IMPROVEMENTS, and Stuart, Iowa, is receiving bids for extensions to its WATER SUPPLY SYSTEM, and for the construction of a SEWERAGE SYSTEM and DISPOSAL PLANT. Both these municipalities have retained as consulting engineer Theodore S. DeLay, Lichty Building, Creston, Iowa.

# NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

## TRAFFIC POST.

### Electric Light Standard for Street Safety.

The growth of population in any city of ordinary planning has invariably caused increasing hazards of traffic. This has necessitated safety rules and regulations and other devices for the control of traffic. Not all dangerous points can be protected by traffic police at all times and other guides for vehicles at intersections and crossings must be substituted. The traffic post has been particularly successful in this type of service and a well-designed, well-located sign can materially reduce accidents and collisions. Traffic can be divided and streams kept to the right and intersecting streets effectively marked with an unmistakable warning.

The Cutter traffic posts are especially designed for this service. Not only do they serve as real traffic guides, but they are also aesthetic in any scheme of street beautification. They are made of high-quality grey cast iron, artistically proportioned and painted in any one of a number of finishes. They are equipped with either ruby or white diffusing globes. The base is fourteen inches in diameter and 24 inches high. The column is five inches, tapering to  $3\frac{1}{2}$  inches in diameter at the top. The height from base plane to the bottom of the globe is six feet.

Installation is simple. Three bolts about 12 inches long and  $\frac{3}{4}$  inches in diameter are set into the concrete foundation. The bolts extend  $2\frac{1}{2}$  inches above the surface and when the post is set on they engage three lugs in its base. A door in the base admits the wrench for tightening. Connections are usually made with cable placed un-

derground. For overhead circuits a cross-arm is furnished to clamp directly beneath the globe holder which has porcelain bushings for the wires to enter. The socket may be had for either series or multiple circuits.

The accompanying illustrations show the post itself and one installed on St. Louis Boulevard, South Bend, Ind. On this street the Park View lighting standards are also made by the manufacturers of the traffic post, the George Cutter Company, South Bend, Ind.

CUTTER  
TRAFFIC  
POST



FOR  
STREET  
SAFETY.

## Paving Mixer in Hawaii.

The illustration on page 690 shows a Chain Belt paving mixer at work recently on a concrete pavement on Front street, city of Hilo, Hawaii. The work was done under the direction of county road overseer Lyman and it is interesting in that, in spite of the low labor costs and high cost of the mixer (due to crating, freight, etc.) the work was found economical. The mixer has a capacity of 14 cubic feet, and when the inexperienced native laborer learnt enough to be able to operate the machine at full capacity, from 175 to 225 lineal feet of 20-foot wide pavement was laid daily. The machine was made by the Chain Belt Company, Milwaukee, Wis. The satisfactory work of this machine caused two more mixers to be sold for use in the island—one with steam power and the other with gasoline, and both equipped with 20-foot delivery boom and bucket.

## INDUSTRIAL NEWS

**Cast Iron Pipe.**—Chicago—The advance in pipe prices of \$3 per ton was followed two days later by another of \$2 per ton. At Chicago an award of 15,000 tons has been made to the leading interest at \$35 per ton and 3,300 tons to the American Cast Iron Pipe Company at a slightly lower figure. The United States Cast Iron Pipe & Foundry Company will also furnish 1,500 tons for Duluth. St. Paul is in the market for 1,250 tons and Bay City, Mich., for 550 tons. Quotations: 4 inch, \$40.50; 6 inch and larger, \$37.50; Class A, \$1 extra. Birmingham.—Southern pipe makers were slow to make the advances warranted by the rise in the price of pig iron, but they finally did



CUTTER TRAFFIC POST AND PARK VIEW STANDARDS ON ST. LOUIS BOULEVARD, SOUTH BEND, IND.

so, the advance of \$1 marked up the week previous being raised by one of \$3 to \$5 more. Just prior to the advances sufficient business came in to justify the continuance of the present scope of operations, but it is more and more apprehended that high prices will curtail the output. The leading pipe company announced a scale of \$35 and \$32 for 4-inch and 6-inch and upward, respectively, while another large maker still quotes \$30 and \$27 respectively. Quotations: 4 inch, \$34; 6 inch and upward, \$31; special lengths, \$1 extra. New York.—The city of New Bedford, Mass., has opened bids on 760 tons of 6 to 30 inch pipe and 60 tons of castings. This is the only public letting of importance that has recently come out. Private buying for spring delivery continues brisk. Export inquiries are coming out in good volume, but the difficulty of securing vessel room presents a formidable obstacle to the closing of contracts. The market is firm. Quotations: 6 inch, class B and heavier, \$37.50, class A, \$38.50.

**Lead.**—Lead has been active and prices have advanced. Quotations: New York, 7.15 cents; St. Louis, 7.00 cents.

**The White Company**, Cleveland, O., have just published a new book which should prove of decided interest and permanent value in the library of county commissioners, engineers, state highway officials, contractors and anyone else concerned in the highway field. The book, "White Good Roads Truck," is worth the months spent in careful research and investigation, and the facts and figures analyze the problems of good roads and their efficient construction and financing very strikingly. The data on motor truck operation in highway work is not only authentic and accurate, but is presented in a very readable way in this convincingly edited, excellently printed and profusely illustrated volume. It is for general distribution to all really interested in good roads, and these are urged to acquire a copy.

#### Chicago Cement Show.

The Cement Show, which has been held in Chicago nine successive years, will occupy the Coliseum and annex for its tenth exhibition, February 7-15, 1917. The number and character of exhibits for which space has already been reserved insure its success. The Tenth Cement Show will be housed under one roof, making necessary the use of the balcony as well as the main floor and annex of the Coliseum. Applications have been made by prospective exhibitors for 60 balcony spaces in addition to all the main floor and annex. The exhibits assigned to the balcony would make a fair-sized Cement Show in themselves. Because of the impracticability of placing heavy exhibits in the balcony, it was necessary to assign the lighter exhibits there. They will make an interesting and attractive display. The exhibits as a

whole are representative of the cement industry and allied interests to even a greater extent than those in previous shows. Road building machinery and equipment particularly will form interesting and instructive features of the show. These include road crushing machinery, sand and gravel screens and washers, storage bins, car unloading chutes, motor trucks and trailers, dump wagons, excavators, scarifiers, graders and road rollers, which, in addition to equipment for handling and placing concrete, will give the road engineer and builder an excellent opportunity to learn methods of use and comparative values of equipment.

**Use of Street-Cleaning Devices in Chile.**—A great number of opportunities occur each year throughout the country and the United States Consul at Antofagasta advises manufacturers of machinery for municipal purposes to secure representation, preferably in Santiago. For instance, the board for the administration of the municipal loan, Antofagasta, is asking for proposals, to be opened December 16, for one automotor to flush and clean streets and two automotors for the collection of garbage. In this case, in the garbage wagons, horsepower should not be less than 25; gear drive instead of chain drive; wheel base not over 4 meters (157.48 inches); maximum speed, 25 kilometers (15.5 miles) per hour, with three forward speeds and one reverse; carburetor to permit use of gasoline and cheap petroleum distillates as fuel; box of light material, so that it can be operated mechanically from seat of chauffeur, dumping backward; the top edge of the box not over 2 meters (78.74 inches) from the ground. The requirements of attachment of 5-peso revenue stamp and the accompanying of the bid by bank certificates of deposit of 1,000 pesos each indicate the necessity of having local representatives.

#### NEWS OF THE SOCIETIES

(Continued from page 688.)

At luncheon "The Co-ordination or Amalgamation of Civic Forces" was discussed, and at the afternoon meeting the general subject was "Problems in City Planning." George E. Hooker, secretary of the Chicago City Club, spoke on City Planning and Political Areas; J. Horace McFarland, president of the American Civic Association, on How Not to Plan Cities; Nelson P. Lewis, Methods of Financing City Planning Projects; and R. H. Whitten, on Progress of District Planning in New York City. Discussion was opened by George B. Ford, and following this there were three-minute reports from the cities.

A general session was held at the High School of Commerce at 8 o'clock in the evening. The general subject was "The Extension of Municipal Activities and Municipal Expenditures." Mrs. M. K. Simkhovitch spoke on "The City's Responsibility to Its Needy; a City Department to Fight Poverty"; "Private and Public Welfare Activities," by A. T. Burns, and "The Extension of Municipal Activities and Its Effect on Municipal Expenditures," by W. M. Prendergast, were other addresses. Following the meeting there was a reception and smoker at the Colony Club.

The practical operation of various forms of city government was the subject for discussion before the Saturday meeting. H. M. Waite presided and the speakers and subjects were: "Evolution of Types of Municipal Government in the United States," Prof. Howard L. McBain; "Recent Changes in Town Government," Prof. E. A. Cottrell; "The Dayton Plan in Operation," J. M. Switzer; "Some Observations on the Progress of the City Manager Plan," R. S. Childs. "Governmental Difficulties in Cities" were discussed by M. P. Porter for Buffalo, A. L. Weil for Pittsburgh, W. J. Locke for Alameda,



CHAIN BELT PAVING MIXER AT WORK IN HILO, HAWAII.

Miss Ethel Hutson (by letter) for New Orleans, and by K. B. Ward for Sandusky. At the noon luncheon there were three-minute talks by delegates on "The National Municipal League: Its Works and Activities—How to Improve Them."

#### Conference on Municipal Research.

The headquarters of this conference were at the Hotel Highland and the first meeting was held Wednesday afternoon with R. Fulton Cutting, chairman of the New York Bureau, presiding. The subject of discussion concerned the most effective type of bureau organization, such as form of organization, relation of trustees, kind of staff, director's duties, outside influences, politics and chamber of commerce control. E. P. Goodrich for F. A. Cleveland reported for the New York Bureau, R. E. Wright for the Denver Civic and Commerce Association, C. N. Hitchcock for the New York Institute of Public Service, T. L. Hinckley for the Toronto Bureau, and Mayo Fesler for the Cleveland Civic League. F. L. Olson of the Akron Bureau also spoke, describing the methods of securing and disseminating publicity. He held that "when publicity jeopardizes the progress of an efficient administration it should be withheld."

General discussion of standard practices, charter reforms and methods of securing financial support were discussed at the dinner in the evening. At the Thursday morning session the discussion was on the proper training for public service. Various ideas were brought up and there was no general agreement on the subject. In the afternoon the discussion was on "Methods of Publicity, When Publicity Should Be Withheld and to What Extent Bureau Activities Should Be Made Public."

At the final meeting officers were elected and several resolutions passed decreeing that "as citizens' agencies, municipal research organizations cannot consistently make the publication of facts dependent upon confidential relationship with public officials or upon questions of political expediency." The following officers were elected: President, Dr. L. D. Upson, Dayton; vice-president, John Fay Putnam, Milwaukee; secretary, C. O. Dustin, Springfield; treasurer, T. L. Hinckley, Toronto; executive committee consists of the officers and E. P. Goodrich. The league hereafter will be known as The National Federation of Governmental Research Agencies.

#### Allied Meetings.

The Massachusetts Single Tax League held its meeting at the Clinton Hall Hotel Tuesday evening. The Massachusetts Civic League met Tuesday afternoon at the Worthy Hotel and discussed the housing situation in Massachusetts. The report of the nominating committee resulted in the following elections: President, Joseph Lee; vice-presidents, Edward Cummings and George D. Chamberlain, formerly member of governing commit-

tee; treasurer, Lawrence G. Brooks; governing committee, Francis Bardwell, Jeffrey R. Brackett, C. C. Carstens, Helen Cheever, Richard K. Conant, Caroline J. Cook, Frances G. Curtis, Elmer S. Forbes, Edith H. Howes, Fred R. Johnson, Harry Levi, Alice Higgins Lothrop, Edwin Mulready, Cornelius A. Parker, Herbert C. Parsons, William H. Pear, Annette P. Rogers, Michael J. Scanlan, Frankwood E. Williams, James F. Wise.

A breakfast conference was held Thursday by the Training School for Public Service and the Western New England Chamber of Commerce held meetings Wednesday afternoon and evening. W. H. Lee of New Haven was elected president, and G. E. Foss secretary and treasurer of the Chamber of Commerce. The Civic Secretaries' Committee held meetings Thursday and Friday at the Hotel Kimball. R. S. Binkerd, Prof. A. R. Hatton and Melvin Porter were among the speakers. The Intercollegiate Division of the Municipal League held its meetings Wednesday and Thursday at the Hotel Cooley. Among the prominent speakers were M. L. Cooke, C. A. Beard, G. W. Perkins and E. P. Goodrich.

The fourth annual conference of Massachusetts planning boards discussed recent city planning legislation, Henry Sterling, George B. Ford and H. P. Kelsey being among the speakers. Mr. Ford described the recent zoning ordinance passed by New York City and stated that the heights of buildings are now under control in that city, but said it would be unfortunate if this law should be applied to other cities as it stands, since there are provisions in it which were necessitated by the exceptional conditions to be found in New York.

The officers elected for the ensuing year are: chairman, Charles S. Bird, Jr., of Walpole; vice-chairman, Preston Fond of Winchester; secretary, Arthur C. Comey of Cambridge; treasurer, Joseph Finberg of Attleboro; executive committee, Augustus P. Loring, Jr., of Beverly, two years, and Frederick Law Olmsted of Brookline, three years. Mr. Shurtliff, the third member of the committee, did not come up for re-election.

The civic secretaries' committee of the national municipal league re-elected Addison L. Winship of Boston, president. Other officers elected were: Treasurer, Miss H. Marie Dermitt of Pittsburgh, Pa.; secretary, Robert F. Gentry of Kansas City, Mo.; membership committee, Miss Demitt, chairman, Melvin P. Porter of Buffalo, N. Y., and Theodore F. Moench of Brooklyn.

#### American Society of Mechanical Engineers.

The annual meeting of the American Society of Mechanical Engineers is to be held December 5-8, 1916, at the headquarters, 29 West 39th street, New York City.

On Tuesday afternoon, December 5, at 2 p. m., there will be a conference of

local sections, attended by official delegates from the sections at Atlanta, Birmingham, Boston, Buffalo, Chicago, Cincinnati, Detroit, Indianapolis, Los Angeles, Minnesota, New Haven, New Orleans, New York, Philadelphia, St. Louis, San Francisco and Worcester.

At 8.30 p. m. the presidential address will be delivered by Dr. D. S. Jacobus on "The Relation of Education to Engineering." A reception will follow.

Among the papers to be presented are:

The Proportioning of Surface Condensers. George A. Orrok.

The Testing of House-Heating Boilers. L. P. Breckenridge and D. B. Prentice.

Water for Steam Boilers—Its Significance and Treatment. Arthur C. Scott and J. R. Bailey.

Steam Safety Valves. George H. Clark.

Standardization of Power Plant Operating Costs. Walter N. Polakov.

Tests of 30,000-K.W. Turbine. H. G. Stott and W. S. Finley, Jr.

Bearing Lubrication. Boynton M. Green.

An Investigation of the Dynamic Pressure on Submerged Flat Plates. Howard E. Stevens.

Report on Safety Standards for the Operation of Cranes.

The Utilization of Waste Heat for Steam Generating Purposes. Arthur D. Pratt.

Graphic Methods of Analysis in the Design and Operation of Steam Power Plants. R. J. S. Pigott.

The Impact Tube. Sanford A. Moss. Power Plant Efficiency. Victor J. Azbe.

The Flow of Air and Steam Through Orifices. Herbert B. Reynolds.

Accurate Appraisals by Short Methods. J. G. Morse.

How Does Industrial Valuation Differ From Public Utility Valuation? John H. Gray.

Relation Between Perpetual Inventory Value and Appraisal Value. Charles Piez.

Valuation of Industrial Properties vs. Valuation of Industrial Methods. Walter N. Polakov.

Productive Capacity a Measure of Value of an Industrial Property. H. L. Gantt.

A Gas Producer for Bituminous Fuel. O. C. Berry.

Commercial Sampling and Gas Analysis. P. W. Swain.

An Investigation of the Internal Combustion Engine as Applied to Traction Engines. A. A. Potter and W. A. Buck.

The Ratio of the Specific Heats and the Coefficient of Viscosity of Natural Gas from Typical Fields. Robert F. Earhart.

The Talbot Boiler. Paul A. Talbot. The Downflow Type of Steam Boiler. John C. Parker.

There will be a number of social features, with very attractive programs. A public hearing by the Boiler Code Committee will also be held.

# ADVANCE CONTRACT NEWS

## ADVANCE INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS.</b>				
Cal., Fillmore		Dec.	1.. Four miles cement curbs and sidewalks.....	E. M. Lynch, City Engineer, Glendale, Cal.
Fla., St. Cloud		Dec.	1.. 11,000 sq. yds. hard-surface pavement with granite curb..	W. A. Ginn, Engr. in charge
Tenn., Memphis		Dec.	1.. Constructing 10 miles of gravel road, estimated cost \$20,000 .....	Board of Co. Supervisors
Fla., DeLand		Dec.	1.. 31,653 sq. yds. paving, 38,592 lin. ft. granite or sand cement curb, and sand cement headers.....	G. A. Kreka, Bd. of Pub. Wks.
Neb., Havelock	8 p.m.	Dec.	1.. Paving with vertical fiber brick, asphalt filler, curb, gutter and grading.....	Asher J. Blout, City Clerk, County Surveyor.
O., Elyria		Dec.	2.. Improving 1 1/2 mile of road.....	C. E. Bloomer, Clk., Co. Comrs.
O., Norwalk		Dec.	2.. Constructing concrete or monolithic brick pavements.....	J. M. Allen, Co. Aud.
Ind., Greencastle	2 p.m.	Dec.	4.. Constructing gravel roads.....	Raymond O'Rourke, Boro. Clk.
Pa., East Pittsburgh	7 p.m.	Dec.	4.. Excavating 1,800 cubic yards of earth.....	Engr., Bureau of Engineering.
N. Y., New Brighton	noon	Dec.	4.. 3,600 sq. yds. bituminous concrete on concrete base.....	H. L. Washburn, Co. Aud.
Tex., Houston	10 a.m.	Dec.	4.. Resurfacing Katy Rd. with gravel.....	H. A. Hendry, Clk. Co. Comrs.
Fla., Tampa	2 p.m.	Dec.	4.. Clearing, grading and bridging 55 miles of highway.....	Chancery Clerk.
Miss., Columbia		Dec.	4.. 2.19 miles gravel road construction.....	W. H. Lynch, Supt. of Sts.
Pa., Harrisburg	noon	Dec.	4.. Grading 27th St.....	J. M. Allen, Co. Aud.
Ind., Greencastle	3 p.m.	Dec.	4.. Constructing gravel roads.....	J. B. Enlow, Co. Aud.
Ind., English	2 p.m.	Dec.	4.. Constructing stone road.....	S. M. Royer, Co. Aud.
Ind., Spencer	2 p.m.	Dec.	4.. Constructing stone road.....	Glen Zell, Co. Aud.
Ind., Connorsville	2 p.m.	Dec.	4.. Constructing gravel road.....	County Commissioners
O., Lisbon	1 p.m.	Dec.	4.. Constructing 7 miles of 14-ft. brick pavement on concrete base.....	W. R. Koonce, Co. Engineer.
Ala., Dothan		Dec.	4.. 125-ft. steel bridge and 3 miles of turnpike.....	Roy Slater, Co. Aud.
Ind., Newport	10 a.m.	Dec.	4.. Constructing gravel road.....	W. S. Keller, State Highway Engr., Montgomery, Ala.
Ala., Eutaw		Dec.	4.. Construction section of state trunk road.....	H. W. Austin, Pur. Agent.
Minn., St. Paul	10:30 a.m.	Dec.	4.. Grading a number of streets.....	H. A. Hendry, Clerk Board of Co. Comrs., Lee County.
Fla., Tampa	2 p.m.	Dec.	4.. Clearing, grubbing, grading and bridging highway, about 55 miles .....	Board of Public Works.
Wis., Green Bay		Dec.	5.. Constructing 97,875 sq. ft. reinforcing for paving.....	A. G. Briggs, City Clerk.
Cal., Berkeley	10 a.m.	Dec.	5.. Concrete curb and gutter, etc., on a number of streets.....	J. P. Hammond, Co. Aud.
Ind., Rensselaer	2 p.m.	Dec.	5.. Grading and constructing stone road.....	W. L. Benson, Co. Aud.
Ind., Kokomo	10 a.m.	Dec.	5.. Constructing stone road.....	A. G. Fisher, Co. Aud. . . . .
Ind., Monticello	10 a.m.	Dec.	5.. Constructing gravel road.....	J. I. Muentzer, Co. Aud.
Ind., Vincennes	2 p.m.	Dec.	5.. 7,128 ft. gravel road construction.....	J. B. McCloskey, Co. Clerk.
Cal., Ventura	2:30 p.m.	Dec.	5.. 6,300 sq. yds. Warrenite paving on bridges.....	Charles Davis, Co. Aud.
Ind., Rockville	11 a.m.	Dec.	5.. Constructing 5 gravel roads.....	L. P. Hagan, Chmn. Co. Comrs.
Fla., Sanford		Dec.	5.. Laying 13,700 sq. yds. brick pavement, 19,500 ft. of curb, 525,000 brick and 550 barrels of cement.....	Walter G. Kirkpatrick, Engr., Farley Bldg., Birmingham, Ala.
Miss., Canton		Dec.	5.. Building 40 miles of earth road, 18 miles to be surfaced with sand-clay, bridged, etc.....	
N. J., West Orange	8:15 p.m.	Dec.	5.. Constructing concrete curb with iron trim and block gutter .....	C. A. Winston, Town Engr.
Ind., Angola	1 p.m.	Dec.	5.. Construction of county line road .....	Frank C. Dewey, Steuben Co. Aud.
Ind., Delphi	noon	Dec.	5.. Construction of gravel, concrete or macadam road.....	H. D. Good, Carroll Co. Aud.
N. Y., Brooklyn	11 a.m.	Dec.	6.. Furnishing 30,000 gals. refined liquid asphalt.....	Bureau H'ways, 50 Court St.
Cal., Huntington Beach		Dec.	6.. Constructing 3 miles of roadway, requiring 20,000 cu. yds. of excavation .....	Board of Co. Supvrs., Santa Ana, Cal.
Wash., Mt. Vernon		Dec.	6.. 13,000 sq. yds. concrete pavement and 8,700 ft. of curb, cost \$32,000 .....	L. J. Caulfield, City Engr.
Cal., Bakersfield		Dec.	6.. Grading, paving and bridging 5.75 miles of road.....	F. E. Smith, Clk. Co. Supvrs.
Fla., Perry		Dec.	6.. Improving 90 miles of road.....	W. A. Sanders, Engr.
Jal., Santa Ana	2 p.m.	Dec.	6.. 2.53 miles concrete pavement.....	Co. Surveyor.
Ind., Shelbyville	10 a.m.	Dec.	6.. 13,692 ft. gravel road construction.....	F. W. Fagel, Co. Aud.
Ind., Warsaw	10 a.m.	Dec.	6.. 6 miles of concrete road.....	Paul Sunny, Engr., County Court House.
N. Y., New York	11 a.m.	Dec.	6.. 30,000 gals. refined asphalt in liquid form.....	L. H. Pounds, Boro. President, Brooklyn.
N. J., Elizabeth	2:30 p.m.	Dec.	7.. 6,145 sq. yds. sheet asphalt, 3,237 sq. yds. granite block pavement and bluestone curbs and headers, about 7,000 feet .....	W. P. Neafsey, St. Comr. Snowden & Hauser, Engrs., Jackson, Miss.
Miss., Lexington		Dec.	8.. Constructing 50 miles of improved road.....	Paxson & Morgan, Engrs., 2d Natl. Bank Bldg., Wilkes-Barre, Pa.
Pa., Plains	10 a.m.	Dec.	8.. Grading, paving and laying concrete sidewalks.....	Harry H. Howe, Co. Aud.
S. D., Sioux Falls	2 p.m.	Dec.	9.. Graveling 11 miles of road.....	County Comrs.
Wash., Asotin		Dec.	11.. Constructing cut-off, including 1 mile heavy rock excav. ....	T. S. De Lay, Engr., Cres-ton, La.
Ia., Algona	8 p.m.	Jan. 11.	10.. 40,000 sq. yds. first-class pavement, and 40,000 ft. combined curb and gutter .....	Herman Dyer, City Clerk F. W. Remsen
Cal., Pasadena		Dec. 12.	11.. 5,000 sq. yds. 5-in. concrete pavement.....	E. L. Gorham, City Engr.
N. J., Somerville		Dec. 13.	12.. Improving 1.25 miles of road.....	Emile Dupaquier, Co. Aud.
La., Lake Charles		Dec. 14.	13.. Paving with concrete, brick and asphaltic concrete; concrete curbs .....	Klyce & Kackley, Engrs.
Ind., New Albany	10 a.m.	Dec. 14.	14.. Constructing 2 miles of road.....	A. L. Smith, Co. Engineer.
Fla., Miami		Dec. 14.	14.. Constr. causeway, incl. viaduct, 2 draw-bridges, retaining walls and fill; cost, \$600,000.....	W. F. B. Haynsworth, City Engineer.
Ala., Grove Hill		Dec. 15.	15.. Improving roads; \$30,000 available.....	
S. C., Greenville		Dec. 15.	15.. Street paving and sidewalks; \$130,000 available.....	

## BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ill., Berwyn		Dec. 16.	Asphaltic concr. and mac. pav. and concrete curbing... Bd. of Local Improvements.	
Ala., Luverne		Dec. 16.	Improving 5 miles of road.....	J. M. Garrett, Co. Engr.
La., Monroe		Dec. 18.	Grading, draining and graveling several roads.....	J. W. Billingsley, Engr.
O., Cleveland Heights (Warrensville P. O.)		Dec. 18.	Grading, draining curbing and paving with brick, asphalt F. A. Pease, Engineering Co. or macadam, several roads.....	Marshall Bldg., Cleveland, O.
Ill., Amboy		Dec. 19.	Paving with brick and constructing combined curb and gutter, cost \$25,000.....	F. W. Leake, City Engr.
Cal., Los Angeles	10 a.m.	Dec. 27.	Grad. oiling and curb. and constr. brick and concr. walks. Board of Public Works.	
O., Sidney	Jan. 1.		Paving 6 miles of streets.....	T. Blake, Engineer.
N. J., Keyport	Jan. 3.		Warrenite paving on concrete base, cost \$65,000.....	G. D. Cooper, Co. Engr., Red Bank
Ia., Independence	Jan. 10.		Paving 31 blocks, cost \$100,000.....	City Clerk.
Ia., Cedar Rapids	Feb. 1.		Paving thirteen blocks; cost, \$90,000.....	T. F. McCauley, Engr.
<b>SEWERAGE.</b>				
N. Y., L. I. City	11 a.m.	Dec.	1.. Constructing sewers in many streets and in sizes from 6 to 78 ins.	M. E. Connally, Borough Pres.
Neb., Havelock	8 p.m.	Dec.	1.. Constructing sewer lateral, consisting of 380 ft. 8-in. vitrified sewer pipe, one flush tank, etc.	Asher J. Blout, City Clerk.
Minn., Blue Earth	1 p.m.	Dec.	1.. Constructing tile drainage ditches; cost, \$9,000.....	C. L. Hagger, Engr.
Mich., Detroit	10 a.m.	Dec.	1.. Constructing vitrified crock lateral sewers.....	Geo. H. Fenkell, Comr. P. W.
Minn., Mankato	2 p.m.	Dec.	2.. Tile drainage ditch; cost, \$10,500.....	C. L. Kennedy, Co. Aud.
Minn., Ortonville	2 p.m.	Dec.	2.. Constructing tile drainage ditch; cost, \$21,800.....	A. V. Randall, Co. Aud.
Okl., Marlow		Dec.	4.. Constructing sewer and water system; cost, \$50,000.....	Benham Engineering Co., Concord Bldg., Okla. City.
N. Y., Larchmont		Dec.	4.. Constructing system of sewers.....	L. E. Van Etten, Engr., 12-14 Lawton St., New Rochelle, N. Y.
Mich., Otsego	8 p.m.	Dec.	4.. Constructing 1,450 ft. 8-in. sewer.....	W. G. Conlon, Village Clerk.
Minn., St. Paul	10:30 a.m.	Dec.	4.. Constructing a number of sewers.....	H. W. Austin, Pur. Agent.
N. D., Enderlin	noon	Dec.	4.. Sewer construction .....	Geo. S. Mattson, City Clerk.
N. J., West Orange	8:15 p.m.	Dec.	5.. Constructing 650 feet 12-inch sewer.....	C. A. Winston, Town Engr.
Minn., St. James	1 p.m.	Dec.	5.. Laying 900 feet 14-inch cement drains.....	J. C. Jensen, Co. Aud.
Utah, Ogden		Dec.	5.. Constructing storm water sewer; cost, \$30,000.....	J. H. Tracy, City Engr.
N. Y., Rochester	11 a.m.	Dec.	6.. Constructing sanitary sewer .....	City Engineer.
N. Y., New Brighton	noon	Dec.	6.. 605 ft. 8-in. sewer, connections, etc.	Engr., Bur. of Engineering.
Fla., Perry		Dec.	6.. 1,425 ft. 15 to 39-in. drains.....	W. A. Sanders, Engr.
N. Y., Brooklyn	11 a.m.	Dec.	6.. Constructing sewage pumping station, etc.	L. H. Pounds, Boro. Pres.
N. Y., Rochester	11 a.m.	Dec.	6.. Construction of sanitary sewer.....	City Engr.
Mont., Bozeman	5 p.m.	Dec.	7.. Constructing sanitary sewer .....	C. A. Spieth, City Clerk.
Pa., Plains	10 a.m.	Dec.	8.. Construction of storm sewers on a number of streets.....	Paxson & Morgan, Engrs., 2d Natl. Bank Bldg., Wilkes-Barre, Pa.
N. J., Lyndhurst	8 p.m.	Dec.	11.. Constructing sewage disposal works.....	B. F. Bowe, Engr., E. Rutherford, N. J.
Ia., Des Moines	2 p.m.	Dec.	11.. Constructing tile drainage ditch.....	F. J. Alber, Co. Aud.
Minn., Mankato		Dec.	11.. Constructing sewers and water mains.....	City Engineer.
Ia., Sibley	11 a.m.	Dec.	11.. Constructing sanitary sewer .....	City Clerk.
Kans., Sedan	7 p.m.	Dec.	12.. Constructing sewer system and disposal plant.....	L. A. Wilson, Engr.
Ia., Stuart	8 p.m.	Dec.	12.. 40,000 ft. 8 to 15-in. sewer, Imhoff tank and filter and sludge beds .....	E. T. Archer & Co., Engrs., New England Bldg., Kansas City, Mo.
N. D., Fargo	10 a.m.	Dec.	13.. Construction of 24, 22, 18 and 13-in. sewers.....	T. S. De Lay, Engr., Creston, Ia.
O., Greenville		Dec.	14.. 8,000 ft. 12 to 60-in. sewers; cost, \$55,565.....	A. R. Watkins, City Aud.
Pa., Erie		Dec.	19.. Constructing Mill Creek improvements; estimated cost, \$850,000.....	R. H. Horn, City Engr.
La., New Orleans	noon	Dec.	21.. Constr. 3 12-ft. steel discharge pipes for drain. pumps.....	F. G. Lynch, City Engr.
				G. G. Earl, Gen. Supt. Sewage & Water Board.
<b>WATER SUPPLY.</b>				
Fla., St. Cloud		Dec.	1.. Constructing water works system and power plant.....	W. A. Ginn, Engr. in charge
N. Dak., Hankinson		Dec.	1.. Water works system, power and tank.....	J. F. Druar, Engr., 312 Commercial Bldg., St. Paul, Minn.
Mass., Boston	noon	Dec.	1.. Laying 1,800 lin. ft. 8-in. and 10-in. water pipe.....	Edward F. Murphy, Comr. Public Works.
Pa., Franklin	noon	Dec.	2.. Laying 1,200 ft. 12-in. main and constructing concrete pump well .....	Morris Knowles, Engr., Oliver Bldg., Pittsburgh
Okl., Marlow	7 p.m.	Dec.	4.. Furnishing 250 h. p. engine, 180 k.v.a. generator, switchboard, motor and deep well pump and 19,000 feet 4-inch c. i. pipe, valves, gates, etc.....	George Putty, Mayor.
N. D., Minot	8 p.m.	Dec.	4.. Drilling 10-in. well for water supply, and testing.....	City Engr.
Mich., Pontiac	1:30 p.m.	Dec.	4.. Marine boiler for water works.....	Leman A. Cambrey, City Clk.
Minn., Eveleth	8 p.m.	Dec.	5.. Constructing and completing 14,000 lin. ft. 16-in. c. i. water main .....	City Engr.
N. J., Ft. Hancock		Dec.	5.. Repairing 50,000-gal. water tank and tower.....	Quartermaster
Okl., Okla. City	1:30 p.m.	Dec.	5.. Construction of water work system, including main dam and diversion dam, ditch bridges, well, conduit, etc....	C. L. Simmelbec, City Clerk.
N. J., Bridgeton	8 p.m.	Dec.	5.. Constructing water works system, including 40 tons of 6-in., 67 tons 8-in., 123 tons 16-in., 31 tons 12-in., and 254 tons 14-in. c. i. water pipe; special castings, valve boxes, gate valves, fire hydrants; 11 tons pig-lead; and construction of reinforced concrete coagulation basin and gate chambers .....	Comrs. of Pub. Wks. & Bldgs. Edward Shattuck, Comr. of Purchases and Supplies
O., Cleveland		Dec.	6.. Repairing filtered water reservoir at pumping station.....	J. M. Ford, Mayor.
O., Cleveland		Dec.	6.. Relining clear water basin at flt. plant; cost, \$200,000.....	H. F. Blonquist, City Engr.
O., Cleveland	noon	Dec.	6.. Making core borings in filtered water reservoir.....	Deputy Comr. of Water.
Cal., San Francisco		Dec.	8.. Furnishing pipe fittings, valves, pipe, etc.....	Comr. of Water.
La., Shreveport		Dec.	9.. Constructing and extending water works plant, \$438,000 available .....	Col. J. T. Knight, Depot Quartermaster, U. S. A.
Minn., Mankato		Dec.	11.. Laying water and sewer mains.....	County Comrs.
Wash., Everett		Dec.	11.. Water system and pumping plant for proposed hospital.....	Dir. of Public Service.
O., Columbus	noon	Dec.	11.. Driving wells, etc., at garbage reduction plant.....	H. A. Gilmartin, Secy. Board of Water Comrs.
Mich., Detroit	2:30 p.m.	Dec.	12.. 400 tons large special castings .....	

## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ia., Stuart	8 p.m., Dec. 12.	Installing and laying 39,000 ft. c. i. pipe, hydrants, valves, etc.	T. S. De Lay, Engr., Cres-ton, Ia.	
O., Lima	noon, Dec. 14.	Constructing filtration plant, pumping station, etc., and furnishing equipment	A. L. Methane, Dir. of Public Service.	
D. C., Wash'ton	10:30 a.m., Dec. 15.	Furnishing centrifugal pumps and equipment	Gen. Purchasing officer, Panama Canal.	
Ill., Berwyn	Dec. 16.	3 miles of 6-in. c. i. water mains	Bd. of Local Improvements.	
Man., Winnipeg	noon, Dec. 18.	Construction of 9.5 miles 5 ft. 6-in. reinforced concrete pressure pipe	R. D. Waugh, Chief Com., 901 Boyd Bldg., Winnipeg, Can.	

## MISCELLANEOUS.

Pa., Wilkes-Barre	noon, Dec.	1. Collecting and disposing of garbage and rubbish for 5, 7 or 10 years	Fred Gates, City Clerk.
Ind., Kokomo	2 p.m., Dec.	2. Constructing 2 drainage ditches	Ellsworth Hunt, Construction Commissioner.
Ill., Chicago	Dec.	2. Supplying natural cement to Bureau of Engineering for period ending Dec. 31, 1913	Dept. of Public Works.
Ind., Fort Wayne	10 a.m., Dec.	2. Constructing drainage ditch; cost, \$4,200	R. W. Guenther, Drain. Comr.
Ill., Chicago	11 a.m., Dec.	2. Furnishing Portland and natural cement, lime and sand	W. R. Moorhouse, Comr. P. W. D. C., Washington
D. C., Washington	Dec.	4. Furn. two fitting-out cranes at California Navy Yard	Bur. of Yards & Docks, Navy Dept.
Miss., Gulfport	Dec.	4. Construction of drainage system, including pumping of sand, and construction of reinforced concrete, bridges and culverts	Harrison Co. Bd. of Supervisors.
Mo., St. Louis	11 a.m., Dec.	4. Constructing 100,000 cu. yds. earthwork	Secy. Mississippi River Commission, 1311 International Life Bldg.
D. C., Washington	10 a.m., Dec.	5. Portland cement for navy yards at Puget Sound, Washington and Mare Island, Cal.	Bureau of Supplies & Accts., Navy Dept.
D. C., Washington	10 a.m., Dec.	5. Furn. Portland cement and locomotive crane	Samuel McGowan, Paymaster-General, U. S. Navy.
Tex., Beaumont	10 a.m., Dec.	5. Dredging about 12,000 yds. from river op. city wharf	W. J. Peterson, Hamilton Co. Aud.
Ja., Webster City	1:30 p.m., Dec.	6. Reconstruction of drainage ditches	J. L. George, Co. Aud.
O., Cincinnati	noon, Dec.	6. Furnishing 7-passenger automobile	Ernst Von Bargen, City Pur. Agent.
Minn., Bemidji	10 a.m., Dec.	8. 95 timber bridges over drainage ditches	O. A. Seward, Resident Engr. Wharf & Dock Com.
Ia., Council Bluffs	2 p.m., Dec.	9. Constructing drainage ditch 6.75 miles long	County Auditor.
O., Columbus	noon, Dec. 11.	Furnishing four special garbage wagon gears	G. A. Borden, Pres. Board of Purchase.
Ill., Chicago	Dec. 15.	Constructing rubble breakwater at Indiana Harbor, Ind.	U. S. Engr. Office, Fed. Bldg.
N. D., Fargo	Dec. 16.	Constructing drains, requiring 1,600,000 cu. yds. excav.	W. A. Tucker, Co. Aud.
Chile, Antofagasta	Dec. 16.	Furnishing motor flusher and sprinkler and two motor trucks for garbage collection	Board of Administration.
N. Y., Tompkinsville	Dec. 16.	150-h. p. oil engine (marine) and 1 hoisting engine	Lighthouse Inspector.
Minn., Duluth	1:30 p.m., Dec. 20.	Ditch construction	O. Halden, Co. Aud.

## STREETS AND ROADS

**Birmingham, Ala.**—City engineer will draw an ordinance providing for the improvement of 26th St., south, from Ave. G to Ave. H. For the paving of 14th Ave., south, from 15th St. to 20th St., south. For the grading, curbs, gutters and sidewalks as petitioned for on Ave. W, Ensley, from Warrior road to 29th St.

**Birmingham, Ala.**—City commission confirmed improvement ordinance for certain improvements on 15th Ave. from the east property line of 21st St., south, to the west property line of 22d St., south.

**Birmingham, Ala.**—The county will survey a road from the filter plant on Shades Mountain to the pumping station on the Cahaba River, looking to its permanent improvement after survey and rights of way are secured.

**Gadsden, Ala.**—Street paving bonds to the amount of \$35,000 were sold by the council to J. C. Mayor & Co., of Cincinnati, at 102.15.

**Conway, Ark.**—Road from Conway to Velonia, 18 miles in length, will probably be built. Road will be 22 ft. wide and \$110,000 is available for construction.

**Fort Smith, Ark.**—Mayor urges repaving of Rogers Ave.

**Tucson, Ariz.**—A petition asking the County Board of Supervs. to appropriate \$20,000 for the construction of the road to Mount Lemmon by way of Oracle, and the mining companies on the east side of the Catalinas, is being liberally signed.

**Bangor, Cal.**—Chamber of Commerce favors construction of the proposed Feather River Canyon road and its extension beyond Quincy to connect with a main highway to the east.

**Arcadia, Fla.**—For the following bonds

Messrs. John Nuveen & Co., Chicago, were the successful bidders: Street improvement, \$90,000; sanitary sewer, \$21,000; water works extension, \$19,500; city hall building and site, \$15,000.

**Chicago, Ill.**—Business men and residents of the North and West sides, as well as representatives from both sections of the city favor the proposed scheme of the Chicago Plan Commission to extend Ogden Ave. from Union Park northeast to Lincoln Park at an estimated cost of \$4,000,000.

**Cleero, Ill.**—City Engineer T. L. Moncrief will soon call for bids for paving with brick and constructing concrete curb; estimated cost, \$17,279.

**Galesburg, Ill.**—An ordinance providing for grading of streets and construction of sidewalks in front of acreage property prior to subdivision of such property.

**Joliet, Ill.**—The election defeated the proposition to issue road bonds to the amount of \$1,500,000.

**Joliet, Ill.**—Another great national highway proposed is to run from Gulf of Mexico to the Great Lakes. Plans for the roadway show three courses for vehicles. In the center is a speedway 48 feet wide, where automobiles may "go the limit." On either side is a roadway for ordinary traffic.

**Mt. Carmel, Ill.**—Plans are being made by G. W. Coulter, local, for paving 3 miles of streets in Grayville.

**Springfield, Ill.**—Street improvements for 1917, the downtown district, as follows: Cedar Lake Ave., 13th and Jefferson Sts., with brick. Capital Ave., wood blocks. Reynolds, Jefferson, and 15th Sts., brick. Princeton Ave., 17th, and Hough Sts., brick. Rafter St., asphaltic concrete. Miller St., brick. Alley between Fifth and Sixth Sts. and Sangamon alley and Scarratt St., brick.

**Waukegan, Ill.**—Matter of constructing state road along Wisconsin-Illinois

state line is being considered and will be brought up before the next legislatures of both states. Road will be 150 miles long.

**Crown Point, Ind.**—Bids received Dec. 4, 1916, at 10 a. m., by treasurer of Lake county, for sale \$20,000 highway improvement bonds, 4% per cent, 10 years. M. J. Brown, treasurer.

**Corydon, Ind.**—Bids received Dec. 15, 1916, at 2 p. m., by Treasurer of Harrison county for sale \$20,000 highway improvement bonds, 4 per cent, ten years. Thos. W. Knight, Treasurer.

**Indianapolis, Ind.**—An ordinance passed for the improvement of Terrace Ave. from East to Wright St.

**Kokomo, Ind.**—The Board of Works confirmed a resolution providing for 5-ft. cement sidewalks in Havens St. from Courtland Ave. to Phillips St.

**New Albany, Ind.**—Miller & Co., of Indianapolis, obtained the \$13,800 4 per cent road bonds at a premium of \$162.

**South Bend, Ind.**—Appropriation of \$4,000 for the board of public works to be used on streets and alleys was approved by committee.

**Terre Haute, Ind.**—No bids received for street paving Nov. 22; all work deferred until next spring. Board of public works.

**Algona, Ia.**—About 60 blocks of streets will be paved in 1917.

**Marshalltown, Ia.**—Farmers near Lamotte have joined in a movement which if agreeable to the Bd. of Supervs. will result in the paving of a mile of the Lincoln Highway with concrete. Have already subscribed \$5,200, and the highway has offered 3,000 barrels of cement for the work.

**Tracy, Ia.**—Practically every main street and some connecting streets will be paved by the end of next year if the plans of the city council are carried out.

**Hickman, Ky.**—Election here defeated

street improvement bonds to the amount of \$25,000. John Pyle, city clerk.

**Pineville, Ky.**—Road bonds carried at the election, \$105,000.

**Portland, Me.**—May improve East Deering end of new boulevard; plan to acquire Ilsley Hall on Washington Ave.; to widen and extend Bates St.

**Baltimore, Md.**—The Paving Comm. selected 33 streets which will be improved next year. They are in all sections of the city and comprise about 11 miles. Other streets will be added to the list from time to time, and in addition to this it is planned to pave about six or seven miles of alleys at an outlay of approximately \$150,000. Address R. Keith Compton, Chairman of the Paving Comm.

**Salisbury, Md.**—The election defeated the proposition to issue school, bridge and road bonds aggregating \$112,000.

**Haverhill, Mass.**—North Ave. to be repaired for a distance of 500 ft. from the end of the present macadam northerly direction toward the Plaistow line, at a cost not to exceed \$1,000.

**Springfield, Mass.**—Wood blocks will be laid on Chestnut St. from Carew St. to Sacred Heart Church, in place of the granite blocks.

**Waltham, Mass.**—Public Works committee may consider a petition which has been pending for some time for the layout of W. Dale St. from Murray to Tomlin Sts.

**Detroit, Mich.**—Petition for the widening and resurfacing of Lafayette Ave. east from Hastings to Randolph Sts. Referred to department of public works.

**Houghton, Mich.**—Ontonagon county will spend \$180,000 on road building. Board of supervisors now mapping out program for much work.

**New Buffalo, Mich.**—Improvement association under consideration a new road; also the installation of a high pressure water system may be brought up.

**Bagley, Minn.**—\$20,000 will be spent on the Jefferson highway in Clearwater county next year.

**Duluth, Minn.**—The West End Commercial Club will Dec. 7 discuss improvements. Circulating a petition for the paving of Third St. from Piedmont Ave. to 28th Ave. to have the improvement made next year will be discussed.

**Laurel, Miss.**—Residents petition city commission for more paving; also water mains and sewers are to be laid on a number of blocks. The commissioners have decided to ask the taxpayers for authority to float a \$10,000 bond issue to meet the city's share of the proposed improvements.

**Vicksburg, Miss.**—The next paving contracts which will be considered by the commissioners will be the improvement of Levee St., Crawford, Clay, South and Jackson.

**Chillicothe, Mo.**—Property owners on 9th St. petition for paving of thoroughfare from Elm St. to Broadway. Also that a petition will be prepared shortly for the paving of Broadway from Clay St. to the north end of the street.

**Townsend, Mont.**—The election resulted in favor of issuing \$30,000 road bonds.

**Elizabeth, N. J.**—An ordinance, providing for flagging both sides of Aiton St. from Jersey Ave. to Canton St. with 4-ft. bluestone, also was passed on final reading. Street Commissioner Neafsey was authorized to advertise for bids for the work.

**Elizabeth, N. J.**—An ordinance, passed on final reading, requiring the grading of Lincoln Ave. from Cherry to Chilton Sts.

**Hackensack, N. J.**—Bergen County Bd. of Chosen Freeholders authorized the issue of \$608,000 road improvement bonds.

**Passaic, N. J.**—Board of commissioners orders the grade of Paulison Ave. between Montgomery St. (Wickham St.) and the city limits.

**Trenton, N. J.**—Under orders just approved by State Road Commissioner Edwin A. Stevens, Middlesex county will receive \$5,700 from the State automobile fund to be used for the repair of several roads in the county. Orders were made upon the recommendation of Edward E. Read, division highway engineer of the State Road Department, who has just completed an inspection of the improved roads of the county.

**Albany, N. Y.**—Ordinance passed for the improvement of Rawson St., from Central to Hunter Ave.

**Albany, N. Y.**—See "Sewerage."

**Ballston Spa, N. Y.**—Approval having been received from the State Department of Highways for the widening of the Rexford Flats to the Grooms Corners

county highway from 12 to 16 ft., the necessary resolution was adopted by the board of supervisors. The additional cost will be \$10,000, of which the state pays \$6,500 and the county \$3,500. The contract for the road has been let.

**Batavia, N. Y.**—Highway estimates approved by the town board call for the raising of \$9,000, as follows: General highway expenses, \$6,000; repairs to bridges, \$2,000. Estimates for highway work have been approved by the town board of Alabama. The total to be raised is \$5,700, as follows: For highway purposes, \$4,000; small bridge at Sour Springs, \$200; repairs to other bridges, \$500. Elba's town board has approved of the raising of \$4,600 for highway work as follows: General, \$2,950; repairs to bridges, \$500; machinery, \$500; miscellaneous, \$700. Penbroke's estimate calls for the raising of \$5,350, as follows: For highway purposes, \$3,900; bridges, \$500; machinery, \$350; miscellaneous \$600.

**Gowanda, N. Y.**—Street paving bonds were sold to Messrs. Geo. B. Gibbons & Co. of New York, amount \$14,000. Franklin J. Herdeg, village clerk.

**Hinsdale, N. Y.**—Town voted Nov. 7 in favor of issuing highway and bridge bonds for \$12,000.

**Jamaica, L. I., N. Y.**—Petition for regulating, curbing, recubing and paving in Twombly place, from Division St. to Carlisle St. (Church St.), was adopted, and a petition for regulating and grading the sidewalk and gutter spaces and laying of sidewalks on the south side of 88th (Brandon) Ave., from 109th St. (Napier Ave.) to 110th St. (Bedford Ave.).

**La Salle, N. Y.**—The town board voted to raise \$1,500 for repairing and improving highways next year, and also made the following appropriations: Bridge repairing, \$350; road machinery, \$100.

**Lockport, N. Y.**—Supvrs. Silsby and Atwater introduced a resolution that the county highway supt. make a survey of the county line road between Orleans and Niagara to determine whether or not it should be improved. The road is 8½ miles long. It extends from route No. 30 to the Lake road. A like resolution will be offered to the Orleans Co. supvrs. Each county will bear one-half the cost of the work.

**Mt. Sinai, N. Y.**—For about \$5,000, village plans to pave Main St.

**New York City, N. Y.**—Members of the Broadway Association applauded the announcement at their luncheon that Broadway would soon be suitably repaved from Vesey St. to 42d St. President Jefferson De Mont Thompson said that he had been assured by Borough President Marks that final action would be taken and that within 90 days the work of repaving would begin. Also for better lighting and traffic regulations for the theater attendance in the Broadway amusement center will be discussed shortly.

**Rensselaer, N. Y.**—A bluestone walk was ordered constructed on Fourth St. and John St.

**Syracuse, N. Y.**—Common Council voted to extend Harrison Pl. through from Harrison St. to East Adams St. to about 200 ft. long and the width of the street, 46 ft.

**New Bern, N. C.**—Craven county will soon have nine miles of brick roads. Four and one-half miles is to be placed on the Trent road, the same amount constructed on Vanceboro road.

**Wilmington, N. C.**—The improvement of Water St. from Dock to Grace and of Nutt St. from Grace to Red Cross and the extension of the city's water mains to the northeastern part of Wilmington met with the endorsement of the Chamber of Commerce. Also endorsed the proposed improvement of S. Front St. beyond Castle. The proposed improvements to streets will cost not less than \$30,000. It is estimated that it will require not less than \$6,000 to secure the extension of the water mains.

**Cleveland, O.**—Brooklyn, Parma and Royalton Civic Association decided to widen the Center Ridge Rd. from the city line to Royalton, a distance of 8 miles; voted to ask the Cleveland Electric Illuminating Co. to extend its lines in this road from Wooster Rd. to Royalton, and went on record as favoring a \$20,000 bond issue to erect a new town hall in Parma.

**Columbus, O.**—Louis A. Olcott, member of the council, has recommended the submission of \$500,000 bond issue for street improvements which shall improve the paving and widening of North High St., the improvement of Fourth St., Main St. and Cleveland Ave.

**Crooksville, O.**—Bonds will be issued

to amount of \$9,000 for street improvements. Carried at recent election.

**Hamilton, O.**—The election defeated the following bonds: City hall, \$200,000; road improvement, \$100,000; fire department, \$60,000; lighting system, \$10,000.

**Marion, O.**—County Surveyor William E. Weston announced that approximately \$140,000 will be used for the building of the new roads in Marion County next year.

**Marion, O.**—Bids received 12 noon, Dec. 20, to purchase two separate issues \$39,300 bonds for paving and sewers of several streets; also \$92,500 for extending the time of payment of certain indebtedness of main street paving and Uhler Ave. sewer and paving and sewers of several other streets and avenues.

**Marietta, O.**—A petition for a new county road in Wesley township was presented to the county commissioners. December 14th was set for viewing the road. Final decision will be made in the matter Dec. 20. The proposed road will begin at the Bartlett-Fattin's Mills road, 500 ft. south of the Wolf Creek bridge.

**Martins Ferry, O.**—The council will arrange for the repaving of Belmont St., Noble St. and portion of Guernsey St. It is proposed to have these plans prepared so that contracts can be awarded early in the spring.

**New Bremen, O.**—Engineer George Champ, Nasby Bldg., Toledo, will prepare the plans and specifications for the paving of Main, Franklin and Pearl Sts. This work will be advertised early in the spring.

**North Lewisburg, O.**—Street improvement bonds at recent election was defeated \$10,000.

**Toledo, O.**—East Side Commercial Club asks repair on Main St. paving; also to have First St. from Oswald to Platt Sts. paved.

**Youngstown, O.**—See "Sewerage."

**Ardmore, Okla.**—A campaign was made to raise funds to build a macadam road to the three oil fields in the county. The fund now is above \$100,000 and the road is assured.

**Frederick, Okla.**—The City Council has acted favorably on the petition of property owners on Main St., between Grand Ave. and Floral Ave., to have that street paved with concrete.

**Tishomingo, Okla.**—Election defeated proposition to issue Thomas township road bonds to the amount of \$20,000. J. A. Howard, county clerk.

**Ashland, Ore.**—Special committee of city council recommended the widening of upper end of Park Drive.

**Baker, Ore.**—Under orders from City Commissioner E. A. Whittier, City Engineer L. R. Stockman is drawing plans for a steel bridge to cross Powder River at Center St., taking the place of the present wooden structure.

**McMinnville, Ore.**—The West Side Pacific Highway Association voted that a committee of five be appointed to draft suitable plans to submit to the voters of Yamhill county a bond issue of \$500,000 for the hard surfacing of various county roads covering approximately the following routes: From Rex, or the Yamhill county line near there, to Willamina by way of Dayton and Lafayette; from the Yamhill county line near Gaston, by way of Yamhill and Carlton; from Dayton to the Polk county line on the Salem road; also from the concrete bridge at McMinnville through Amity to the Polk county line.

**Oakridge, Ore.**—Citizens voted to levy a 5-mill road tax for the coming year. This will raise about \$2,500, of which \$500 will be put on the High Prairie road, \$300 on the Kitson Creek road and the remainder on the main highway in the vicinity.

**Portland, Ore.**—The proposed appropriations for the county road work has been cut to \$451,000, reduction of \$242,000 from Roadmaster Yeon's original estimate. It may be even further reduced to allow for the first unit of the proposed county public building.

**St. Helens, Ore.**—The Warren road from near McNulty Creek bridge through Warren and as far as Scappoose Creek will be temporarily improved at once.

**Germantown, Pa.**—Committee on highways has approved a bill for the grading of Morris Logan St., from Abbottsford Ave. to Logan St., and Abbottsford Ave., from McKean Ave. to Morris St.

**Wilkes-Barre, Pa.**—City council decided to pave the graded portion of North Washington St. with asphalt instead of brick.

**Wilkes-Barre, Pa.**—City council authorizes grading, curbing and paving of

Brook St. between Barney and Walter Sts. with a sheet asphalt pavement.

**Williamsport, Pa.**—Borough Council may plan for Market St. extension to meet the Elmsport Pike.

**Centreville, Tenn.**—Hickman coun'y sold an issue of \$225,000 in 5 per cent. good roads bonds; successful bidder Fourth & First National Bank of Nashville; premium \$10,800; for improving roads in county.

**Austin, Tex.**—The attorney general's department has approved the Morris county \$20,000 road bond issue, Dist. No. 1.

**Dallas, Tex.**—A petition signed by a large number of property owners asking for the paving of Good St. from Elm to Bryan was granted. Uvalde asphalt was the material asked.

**Dallas, Tex.**—Among the items of street improvements considered and acted upon by board of city commissioners was the approval of specifications for the construction of a sidewalk, curb and gutter on Sanger Ave., from Ervy to Lewis Sts. The city secretary was instructed to advertise for bids.

**Denton, Tex.**—Election Dec. 21 to issue \$1,000,000 for good roads.

**El Paso, Tex.**—To vote on the following bond issues an election will be held Dec. 19: Septic tank, \$100,000; storm sewer, \$75,000; street, \$40,000; sewer extensions, \$10,000.

**Gainesville, Tex.**—A proposition has been submitted to the chamber of commerce to build a paved road from Ardmore through Lone County, Okla., to Red River, 7 miles north of city, if local business men build the toll bridge over the river that is proposed and pave the road from Gainesville to the river. A \$60,000 bridge is contemplated.

**Galveston, Tex.**—Resolution adopted for paving of Ave. O. Bids will be advertised for various kinds of pavements.

**Shamrock, Tex.**—At a special election road bonds to the amount of \$50,000 were voted in the southern part of Wheeler county, 6 miles wide by 30 miles long, and extending entirely across the county.

**Texarkana, Ark.-Tex.**—Texarkana citizens desire modern street paving in the future on their side of city. Committee appointed to act with city attorney Dorough to prepare amendment to city charter.

**Waxahachie, Tex.**—The following bonds recently authorized have been sold: Sewerage disposal plant, \$20,000; street paving, \$10,000.

**Salt Lake City, Utah.**—To make the 12 national forest reservations in Utah accessible and build highways through these great domains which will bind the state in a system of modern highways the national and state governments have been working in amity several years. A meeting between state and federal officials was held to plan five years' systematic building. E. R. Morgan, state road engineer; W. D. Beers, state engineer, and L. P. Kneipp, United States district forester, were present. Taking appropriations of the last Congress and the income certain from other sources these officials say the state and nation will spend \$1,000,000.

**Bristol, Va.**—The \$8,000 Scott County (Va.) road bonds have been sold. A portion will be expended on the Boone Way in Scott County. Amount spent will be sufficient to grade every mile of this road extending in county. A large distance will be macadamized.

**Norfolk, Va.**—See "Sewerage."

**Charleston, W. Va.**—Better fire protection for the city and a permanent road in Putnam county will be discussed by Chamber of Commerce.

**Grafton, W. Va.**—Road bonds to amount of \$100,000 was defeated.

**Weston, W. Va.**—Nov. 7, the election here resulted in the defeat of the proposition to issue road bonds to the amount of \$1,000,000. Leander Traxell, county clerk.

**Kennicott, Wash.**—An ordinance before the city council for passage, after being approved by the citizens, provides for street paving in the spring, more than a mile of the principal streets to be improved. The specifications and estimates will be prepared by a special engineer and the cost will run from \$13,000 to \$18,000.

**Seattle, Wash.**—Resolution adopted for the improvement of West Spokane St., by constructing an overhead viaduct, etc.; street committee.

**Green Bay, Wis.**—Petitions for aid in building roads during 1917 in towns of Brown county amounting to \$16,050. and for building bridges, \$2,750, were received by the board of supervisors. The towns were granted the following sums

for road work: Allouez, \$650; Ashwaubenon, \$400; Bellevue, \$800; Eaton, \$500; Glenmore, \$1,500; Holland, \$2,000; Humboldt, \$1,000; Lawrence, \$800; Morrison, \$1,000; Pittsfield, \$800; Preble, \$1,000; Rockland, \$900; Scott, \$1,200; Suamico, \$1,200; Village of Wrightstown, \$1,000; Village of Denmark, \$600; Village of Pulaski, \$1,200. For bridge construction the towns were given the following amounts: Ashwaubenon, \$300; Bellevue, \$1,100; Howard, \$1,350.

**Superior, Wis.**—The roads and bridge committee of the Douglas county board of supervisors approved a bond issue of from \$25,000 to \$27,000 for the purpose of building a county road from South Superior to Oliver, which will connect with the steel plant bridge.

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Yuma, Ariz.**—\*O. & C. Construction Co., Yuma, for paving with bitulithic on concrete 26,100 sq. yds., at \$37,584. W. H. Elliott, city engineer.

**Corona, Cal.**—\*John Shea Co., Riverside, secured contract let by city for paving portion of North Main and River Sts., \$10,224.

**Los Angeles, Cal.**—\*John Sufalo secured contract, alley from Orange to 7th St., by constructing concrete pavement, concrete repavement, asphalt pavement, asphalt repavement, cement curb, manhole, reconstruction of a flush tank and all other work.

**Sacramento, Cal.**—To \*A. Teichert & Son, for improving alley between G St. and H St., from the easterly line of 27th St. to the westerly line of 28th St.; reconstructing one brick manhole, constructing one concrete catch basin with sump complete with cast iron curb and cover; placing five linear feet of 6-in. vit. iron-stone sewer pipe; grading the alley and constructing an asphalt pavement, consisting of an asphaltic macadam foundation 3 ins. thick, and a sheet asphalt wearing surface 1½ in. thick.

**Sacramento, Cal.**—For improving alley between G St. and H St., easterly line of 13th St. to the westerly line of 14th St.; constructing concrete catch basin with sump, complete with cast iron curb and cover; placing 5 linear ft. of 6-in. vitrified ironstone sewer pipe; grading the alley and constructing an asphalt pavement, consisting of an asphaltic macadam foundation 3 ins. thick and a sheet asphalt wearing surface 1½ ins. thick: to \*McGillivray Construction Co.

**Hartford City, Ind.**—For the improvement of N. Jefferson St. and sidewalks in N. Walnut St., to the \*Hartman, Townsend & Hartman Contracting Co.; totals, \$3,479.17.

**Terre Haute, Ind.**—Contracts for nearly \$50,000 worth of road building and new concrete bridges were let by county commissioners. \*James McGuire & Son, Brazil, Ind., for the building of the Dowell road, \$3,497, and \*John I. Unison the building of the J. K. P. Stephens road, \$4,487.50. Both are in Pierson township. The successful bidders for the bridge construction were the \*National Concrete Co., Indianapolis, Ind., Anderson bridge, \$11,750; \*Crabb & Landine, Ferguson bridge, \$8,984; \*M. C. Lloyd & Co., Wyeth bridge, \$850; \*M. & P. Co., McKeen bridge, \$4,254, and the \*Carpenter Construction Co., Altekruze bridge, \$10,600.

**Muscatine, Ia.**—Contract for grading Wyoming hill let to \*J. G. Grimm, Wapello, at \$4,348.

**Elkton, Md.**—For 2½ miles macadam road between Miller's Corners and Cawntown County, let to \*E. W. Brown, Port Deposit.

**Boston, Mass.**—Nov. 13 the Mayor approved a contract with \*Frank Drinkwater, at \$2,100, for excavating and grading Caledonia Ave., from Spring St. about 210 ft. southerly, West Roxbury. Bids for the work, opened November 3, were as follows: Daddario & Booth, \$2,925; M. De Sisto, \$3,000; Antony Cefalo, 220 Devonshire St., \$3,300.

**Boston, Mass.**—Mayor approved an award of contract to \*Warren Bros. Co., at \$1,620, for laying concrete walks on North End Beach. Bids for the work, opened Nov. 10, were as follows: John McCourt Co., 728 Parker St., Roxbury, Mass., \$1,770; Jeremiah J. Sullivan, \$1,890; J. C. Coleman & Sons Co., \$2,450; William J. Rafferty, 7 Water St., Boston, Mass., \$2,650.

**Boston, Mass.**—Nov. 23 the Mayor approved a contract with \*V. Grande on North End Beach. Bids for the work, opened Nov. 10, were as follows: John McCourt Co., 728 Parker St., Roxbury, Mass., \$1,770; Jeremiah J. Sullivan, \$1,890; J. C. Coleman & Sons Co., \$2,450; William J. Rafferty, 7 Water St., Boston, Mass., \$2,650.

**Boston, Mass.**—Nov. 23 the Mayor approved a contract with \*V. Grande on Shirley and Norfolk Sts., Massachusetts Ave., Norway, Tremont and Dover Sts.

and Dorchester Ave., Roxbury. Other bidder: J. J. Sullivan, \$4,054.25.

**Blakely, Minn.**—Contract for grading and leveling roads let to \*Otto and Arthur Schmidt.

**Sunset, Minn.**—\*Walter McAndrews, for grading road near Red Lake River.

**Thief River Falls, Minn.**—\*P. W. Rourke secured contract for graveling main streets of city at 98 cts. per cu. yd. S. J. Overland, City Clerk.

**Wahkon, Minn.**—\*Peter Fromwald secured contract for constructing road.

**Omaha, Neb.**—County commissioners awarded the contract for the paving of one mile of the West Center St. road to be paved west from the city limit to the \*E. W. Geiger Construction Co., of Leavenworth, Kan., at \$2.05 a sq. yd.

**Garfield, N. J.**—The contract between the borough and Salvatore Guardabeni, the Lodi contractor, for the improvement of DeWitt St., have not been signed by Mayor Ernest B. Dahner as yet. According to the estimate furnished by Borough Engineer Anton L. Petersen, this improvement will cost \$3,771.79.

**New York City, N. Y.**—\*Asphalt Construction Co., Madison Ave. and 137th St., contract for paving portion West 181st St., about \$10,833, \*Summit Engineering & Construction Co., for paving portion West 134th St., \$49,820.

**New York, N. Y.**—Contract, paving, Navy Yard, New York, Specification 2280, awarded \*Franklin Contracting Co., 52 Vanderbilt Ave., New York.

**Akron, O.**—\*J. C. Devine, Alliance, O., improving Sagamore road at \$16,100, contract let by Commissioners of Summit county. W. G. High, Clk. Edw. W. Paul, Court House, Akron.

**Cleveland, O.**—\*Cleveland Trinidad Paving Co., 420 Lakeside Ave., N. E., for the sum of \$3,775.67, covering the grading, draining and paving of Buckley Blvd. from W. 29th St. to W. 45th St.

**Cleveland, O.**—Board of control with the \*Enterprise Paving & Construction Co., 8436 Broadway, at approximately \$9,200, covering the grading, draining and paving of Coit road, N. E., from the C. P. & E. R. R. to 1,091 ft. southerly.

**Hillsboro, O.**—\*C. Scott & H. F. Morrow, at \$9,108, secured contract let by Comrs. of Highland county, J. F. Ridgway, auditor, for 3½ miles macadam and 5 miles gravel roads. C. F. Clarke, Engineer.

**Huron, O.**—\*H. J. Balts, Norwalk, O., for 5,200 ft. grading and paving in Johnson road, Peru township, let by Comrs. of Huron county, Chas. Bloomer, auditor. L. C. Herrick, Engineer, Court House, Norwalk.

**Pomeroy, O.**—\*Geo. Bauer, Jr., this city, awarded contract for paving Mechanic St. with brick at \$5,500.

**Clinton, Okla.**—\*Western Paving Co., Oklahoma, for paving Frisco Ave.

**Waurika, Okla.**—For 7-mile highway in Earl township, Jefferson county let contract to \*J. Thompson, Ringling.

**Philadelphia, Pa.**—The Department of Public Works has received from the following low bidders: Average unit low bids, letting of Nov. 14, on grading 324,482 cu. yds., total amount of low bids, \$123,869.28; average price, \$0.536: George Moehrle, 2631 N. 28th; R. J. & A. Peoples, 25th and Callowhill; I. K. Davis, 2500 W. Oakdale; F. Mark Contr. Co., 21st and Somerset; J. Devlin, Jr., Hancock and Thompson; Klebe & Co., 1109 W. Dauphin; J. D. Dorney, 1204 E. Montgomery Ave.; F. Connor, 3329 N. 5th; Moss & Taylor, 58th and Girard; T. F. Reilly, 50th and City Ave.; J. J. McHugh, 1430 S. Penn Sq.; Amos Barnes, Righter and Helmit; John O'Rourke, 5109 Aspen; Est. of D. McMahon, Gtn. and Chelten Ave. Following are the low bidders on asphalt paving. Asphalt pavement, including 6-in. concrete base. Total amount of low bids, \$72,292.69. Average price of \$2.878 per sq. yd. Barber Asphalt Paving Co., Land Title Bldg., Philadelphia; Eastern Paving Co., Penn Sq. Bldg., Philadelphia; Mack Paving Co., 20th and Sedgley. Following are the low bidders on paving with vitrified block. Vitrified block pavement, including 6-in. concrete base. Total amount of low bids, \$14,478.94. Average price of \$2.831 per sq. yd. Cunningham Pav. & Const. Co., 1345 Arch St. Following is the low bidder on bituminous macadam surface. Bituminous pavement including 5-in. concrete base. Total amount of low bids, \$2,072. Average price of \$1.863 per sq. yd. P. J. Snyder & Co., Bailey Bldg., Philadelphia. Following are the low bidders on water-bound macadam surfacing. Water-bound macadam including base course and sub-grading. Total amount of low bids, \$19,231.15. Average price of \$1.652 per sq. yd. Anders &

**Snyder, Heck Bldg., Philadelphia;** P. J. Snyder & Co., Bailey Bldg., Philadelphia. Following are the low bidders on bituminous macadam resurfacing. Bituminous pavement including 5-in. concrete base, curbs, grading and incidental work. Total amount of low bids, \$3,075.60. Average price of \$3.415 per sq. yd. Following is the low bidder on repairing and painting bridges. Total amount of low bids, \$48,641.75. American R & C. Co., 211 S. 9th; M. & J. B. McHugh, 892 N. Market. Following are the low bidders on improvement of Passyunk Ave. Total amount of low bid, \$67,691.35. E. H. Ware, Lincoln Bldg.

**Dallas, Tex.**—The contract for the paving of San Jacinto St. from Annex to Garrett, awarded to the \*Texas Bituminous Co. The property owners' part of the expense of this work will be \$18,853 and the city's, \$932.

**Staunton, Va.**—Supervisors let contract for a mile and a quarter of macadam from Cave Station to the Valley pike to \*Sands, Kline & Co.

**Harrisville, W. Va.**—For constructing 20 miles of concrete road in Clay dist.; also City of Pennsboro for paving 1½ miles of streets. Ritchie county let contract to \*Winston & Co., Pennsboro, W. Va.

**Seattle, Wash.**—Bd. of Public Works awards contract for W. 65th St. et al., concrete walks, grading, etc., \*J. L. Smith, 143 21st N., \$31,535.

**Seattle, Wash.**—For improving 11th Ave. N. E. et al., paving, etc., \*Washington Paving Co., Smith Bldg., \$27,994.

**Seattle, Wash.**—For Rainier Ave. paving, etc., \*G. Argentieri & Co., \$15,343.

**Shelton, Wash.**—Comrs. of Mason county awarded contract for construction of section 4 of South Shore road to \*Isaac Wallin and \*E. P. McClure.

**Walla Walla, Wash.**—Following bids opened by commissioners for constructing 12,900 ft. of permanent highway extending from city limits past state penitentiary toward Prescott, about 2 miles. H. L. Wilson, gravel, \$12,900; asphalt, macadam, \$15,575; Jarvis-Buckheimer Co., gravel, \$12,676; crushed stone, \$12,768; asphalt macadam, \$15,900; L. Lanning, gravel, \$11,700; crushed rock, \$12,977; asphalt macadam, \$15,977.75. Contract was awarded to \*H. L. Wilson for \$15,575.

## SEWERAGE

**Birmingham, Ala.**—City commission confirmed improvement ordinance for the construction of sanitary sewers.

**Arcadia, Fla.**—See "Streets and Roads."

**St. Cloud, Fla.**—See "Water Supply."

**Chester, Ill.**—City contemplates construction of sanitary sewer at cost of \$66,000.

**Chicago, Ill.**—The erection of three activating plants for the sanitary district system was recommended by the district engineering department. The buildings to be erected in the Desplaine river district North branch of the Chicago River district and 39th St. district are to reduce stench by removing solids from sewerage.

**Springfield, Ill.**—Sewers proposed to build in the course of the coming year are as follows: Carpenter, Kansas, Miller, Matheny Ave., Rutledge St. City also contemplates further plans for the extension of the town branch sewer which will cost in the neighborhood of \$150,000. A plan covering 8,200 parcels of property is being drawn by Jesse K. Payton, Supt. of the Bd. of Local Improvements, as a basis for a special assessment to cover the cost of the sewer construction.

**Michigan City, Ind.**—The board of public works accepted the proposition of W. S. Shields, of Chicago, as consulting engineer to serve the city in the proposed trunk sewer improvement for the southern section of the city. Engineer's proposition is to study the proposed sewer district, make surveys, plans, etc., and furnish an estimate of the cost of the proposed improvement for the contract price of \$400.

**Haverhill, Mass.**—Orders were presented to the City Council by Alderman Wood for the construction of a sewer in Jordan St. at a cost of \$3,000 and the laying of a 24-in. sewer line around Lake Saltonstall, being a part of the Kenoza Ave. sewer system, at a cost of \$12,000. The orders were laid on the table one week.

**Birmingham, Mich.**—See "Water Supply."

**Gladstone, Mich.**—The sewer bonds for \$14,000 defeated at the election.

**Grand Rapids, Mich.**—Revise plans for sewerage disposal plant will be an-

Plaistow, N. J.—Bids for storm sewers received by the Common Council, November 20, 1916.		Andrew J. Gavett, engineer in charge.	
		42-in. circular sewer	39-in. circular sewer
Quantities . . . . .	110 Lin. ft.	380 Lin. ft.	390 Lin. ft.
Item Number . . . . .	8.75	9.75	10.75
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$8.75	\$9.75	\$11.75
T. Foster Callahan, Elizabeth, N. J. . . . .	9.00	10.75	11.75
*Charles A. Peterson, Plainfield, N. J. . . . .	7.80	8.90	9.80
Harrison & Craig Co., Newark, N. J. . . . .	10.10	11.10	11.20
Clement J. Cogan, Bayonne, N. J. . . . .	8.33	8.81	9.29
John M. Kelley Contracting Co., Camden, N. J. . . . .	8.11	9.87	11.22
H. K. Corbin Co., Inc., New York . . . . .	10.00	12.00	14.00
Quantities . . . . .	180 Lin. ft.	110 Lin. ft.	110 Lin. ft.
Item Number . . . . .	12-14	14-16	14-16
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$4.00	\$75.00	\$100.00
T. Foster Callahan, Elizabeth, N. J. . . . .	25.00	30.00	35.00
*Charles A. Peterson, Plainfield, N. J. . . . .	50.00	60.00	65.00
Harrison & Craig Co., Newark, N. J. . . . .	40.00	47.00	55.00
Clement J. Cogan, Bayonne, N. J. . . . .	47.00	52.00	55.00
John M. Kelley Contracting Co., Camden, N. J. . . . .	47.00	54.00	62.00
H. K. Corbin Co., Inc., New York . . . . .	40.00	50.00	53.00
Quantities . . . . .	18 Lin. ft.	12 Lin. ft.	12 Lin. ft.
Item Number . . . . .	16-18	16-18	16-18
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.40	\$100.00	\$100.00
T. Foster Callahan, Elizabeth, N. J. . . . .	1.35	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	18 Lin. ft.	12 Lin. ft.	12 Lin. ft.
Item Number . . . . .	18	18	18
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$44.00	\$75.00	\$100.00
T. Foster Callahan, Elizabeth, N. J. . . . .	25.00	30.00	35.00
*Charles A. Peterson, Plainfield, N. J. . . . .	50.00	60.00	65.00
Harrison & Craig Co., Newark, N. J. . . . .	40.00	47.00	55.00
Clement J. Cogan, Bayonne, N. J. . . . .	47.00	52.00	55.00
John M. Kelley Contracting Co., Camden, N. J. . . . .	47.00	54.00	62.00
H. K. Corbin Co., Inc., New York . . . . .	40.00	50.00	53.00
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan, Bayonne, N. J. . . . .	1.50	1.50	1.50
John M. Kelley Contracting Co., Camden, N. J. . . . .	1.50	1.50	1.50
H. K. Corbin Co., Inc., New York . . . . .	1.50	1.50	1.50
Quantities . . . . .	1 Lin. ft.	1 Lin. ft.	1 Lin. ft.
Item Number . . . . .	1	1	1
James Ferry & Sons, Inc., Baltimore, Md. . . . .	\$1.25	\$1.25	\$1.25
T. Foster Callahan, Elizabeth, N. J. . . . .	1.60	2.00	2.00
*Charles A. Peterson, Plainfield, N. J. . . . .	1.50	1.50	1.50
Harrison & Craig Co., Newark, N. J. . . . .	1.25	1.25	1.25
Clement J. Cogan			

nounced by board of public works. May add \$250,000 to cost.

**Kalamazoo, Mich.**—The election defeated storm sewer construction bonds \$225,000. C. L. Miller, city clerk.

**Sault Ste. Marie, Mich.**—Resolutions for improving Hursley St. by constructing a 9-in. pipe sewer.

**Duluth, Minn.**—Sewers were ordered in Jefferson St. from 24th to 25th Ave. east; in Steelton St. from 95th to 96th Ave. east; in Halifax St. from 41st to 42d Ave. east, and in Halifax St. from 39th Ave. west to a point 250 ft. east of the avenue. A resolution ordering sewers in 11th St. from 5th to 7th Aves. east, and in 6th Ave. east from 11th St. to lot 19, block 5, Chambers' 2d division, was laid over.

**Eveleth, Minn.**—A new sewer line will soon be installed between the city and the pumping station. City commission instructed the city clerk to advertise for bids for 14,000 ft. of 16-in. sewer main, 1 in. thick and to have it laid. In the specifications of having the pipe laid will also be included the placing of all pipe, which is now exposed, under the ground.

**Laurel, Miss.**—See "Streets and Roads."

**Carl Junction, Mo.**—Estimates have been prepared for a sewer system. Address town clerk.

**Minden, Nev.**—An up-to-date sanitary sewer system will be constructed by the Dangberg Land and Livestock Co. In the spring a sewage disposal plant will be built to take care of the entire sewage flow.

**Albany, N. Y.**—Ordinance passed for a sewer in Bradford, between Ontario and Partridge Sts.

**Albany, N. Y.**—The following ordinances were introduced: Alderman Gunn, providing for the curbing of the intersection of Madison Ave. and Allen St.; Alderman Visscher, directing the laying of a sewer in Swan St. from State St. to Washington Ave.; Alderman Schick, authorizing the laying of sewers in Hoffman and Third Aves.

**Cornwall, N. Y.**—Merrell Vrooman, sanitation engineer of Gloversville, will discuss the question of installing a sewage system in the village.

**Niagara Falls, N. Y.**—Rudolph Hering, George W. Fuller of New York and Harrison P. Eddy of Boston will be employed as experts by this city, Buffalo and La Salle to investigate the sewage disposal scheme proposed for frontier municipalities by the International Joint Waterways Commission. Their compensation will be about \$100 a day each, and the investigations, \$6,000.

**Dayton, O.**—Plans for the establishment of Mt. Auburn sewer district No. 1, providing a sewerage disposal system for more than 4 sq. miles of territory located outside the corporation limits of the city. Address county engineer.

**Marion, O.**—See "Streets & Roads."

**Germantown, Pa.**—See "Water Supply."

**Massillon, O.**—Nov. 7, election defeated the following bonds: Sewer, \$19,890; street, \$66,000; park, \$5,000. R. J. Krisher, city auditor.

**Toledo, O.**—To remove all sewerage from Ten Mile Creek in two years, City Engineer McClure says the survey of the district drained by the creek will be ready by spring for plans and specifications for the large intercepting sewer. Engineer contemplated constructing a settling tank at Lagrange St. and permitting the effluent to flow into the creek again at that point. W. H. Dittoe, the chief engineer for the state board of health, suggested that a sewer be constructed on to the river near Bay View Park to carry all the sewage and do away with the settling tank. This sewer to river can eventually be made a part of the intercepting system of the city. This would save the city thousands of dollars.

**Youngstown, O.**—Oscar E. Diser, city solicitor of East Youngstown, has been authorized to contract with Anthony O'Hara, this city, for the construction of a sewer in East Third St. in the village. Bids submitted for a number of other street improvements have been rejected and will be readvertised.

**Germantown, Pa.**—Councilman Pringle Borthwick has introduced bill to construct a sewer in Crowson St. from Locust Ave. to Woodlawn Ave.

**Williamsport, Pa.**—After investigating several cities the various systems of sewerage disposal plants Health Officer Young submits a report to council that the city could install a sewerage plant for 70,000 population, cost of \$120,000; suggests activated sludge process. The report of Farley Gannett, consulting en-

gineer of Harrisburg, estimated cost would be \$304,000, exclusive of the right of way. Engineer recommended Imhoff.

**Aberdeen, S. D.**—Bond issue of \$200,000 for constructing sanitary storm sewer defeated at election.

**Bishopville, S. C.**—Dec. 12 the following bonds will be voted: Sewer, \$35,000; water, \$10,000.

**Dallas, Tex.**—One bid was received for the construction of a storm sewer on San Jacinto St. and was rejected. The city secretary was instructed to advertise for new bids.

**Lockhart, Tex.**—Messrs. Halsey, Stuart & Co., of Chicago, were successful bidders for \$35,000 sewer bonds.

**Port Arthur, Tex.**—The Attorney General's Dept. approved the bond issues for \$100,000 for sewer extension and \$80,000 for waterworks extensions.

**Waxahachie, Tex.**—See "Streets and Roads."

**Ogden, Utah.**—City Engineer Tracy is wrestling with the problem of sewage disposal in connection with the plans for the Third Ward addition to the sewer system, designed to give the city a sewer service adequate for 50 years. Every effort to expedite the preliminary work is being made so as to be ready to advertise for bids early in the spring.

**Ogden, Utah.**—City Engr. Joseph M. Tracy is asking bids for the Madison Ave. storm sewer which will extend from 25th St. to the Ogden River; cost, \$30,000.

**Salt Lake City, Utah.**—Bids will be advertised and opened immediately after Jan. 1 for the proposed new gravity sewer outlet. Cost is estimated at \$60,000 and will be made in the 1917 budget.

**Norfolk, Va.**—Notice of sale of \$582,000 of 4 per cent bonds for street, sewerage and other improvements in the city is being advertised by the finance committee of the city council. Appropriation in detail: Street improvements, Lambs Point sewerage and Smith's creek, \$217,467; Olney road and Granby St. improvements, \$10,000; Huntersville sewerage, \$4,000; Berkley sewers, \$10,000; Norfolk county roads, \$27,000; sewer mains to eliminate the sewer pumping station at Ward and Duke Sts., \$18,200; Smith's Creek another \$10,000; purchase of toll roads, \$4,800; dredging Lake Taylor and Little Creek, \$22,000; dams and spillways in these lakes, \$70,500 and Park Place improvements, \$190,000. Included in the \$217,469 is \$125,000 for Church St.: \$5,000 for a public comfort station, continuance of Newton Creek drains, \$10,000; 40th and 43d St. sewers, \$1,565; 41st St. sewer, \$1,895; 46th St. sewerage, \$910; 25th and 27th St. sewerage, \$1,172, and various other items.

**Seattle, Wash.**—Resolution adopted for the construction of a trunk sewer and outfall in 42d Ave., South; street committee.

**Seattle, Wash.**—Plans submitted for W. and N. 45th St. sewers, \$16,000.

**St. John, N. B.**—See "Water Supply."

#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Los Angeles, Cal.**—To \*Adam Dalmatin, at \$1,222, for a 10-in. pipe sanitary sewer in Cahuenga Ave., from a point 215 ft. northerly from a line parallel to and 9 ft. southerly from the center line of Dix St. (between Cahuenga Ave. and Holly Drive), to a point 211.4 ft. southerly from the center line of Curlew St.

**Los Angeles, Cal.**—To \*B. Zaich, \$774, for a vitrified pipe sanitary sewer in Irolo St. and 10th St. to a point 65 and 85 hundredths ft. southerly of the center line of San Marino St.

**Los Angeles, Cal.**—For a vitrified pipe sanitary sewer in Los Feliz Ave. and Vernon Ave., \*John Sutalo, \$649.

**West Hartford, Conn.**—To \*L. Petrossi, 39 Woodbridge St., Hartford, secured contract for sewer in Walbridge Rd., Blvd. and Ellsworth St.

**Kokomo, Ind.**—\*O. B. Peters, Kokomo, contract for sewers in Loretta St. and Virginia Ave., about \$4,647.

**Clarendon, Ind.**—Contract for constructing sewer let to \*J. A. Adams, Centerville; 3,000 ft. at 65 cts. per ft.

**Clay Center, Kan.**—For sanitary and storm sewer, \*E. D. Reed, at \$651.50 and \$17,187.50. Engineer, C. R. Welsh; owner, city of Clay Center, E. R. De Bray, Clerk.

**Boston, Mass.**—Nov. 17 the Mayor approved contract with \*William L. Dolan at \$2,314.50, for pipe sewers and drains in Florence and Wyvern Sts., between Westbourne Rd. and Hyde Park Ave., West Roxbury. Bids for the work,

opened November 3, were as follows: A. Cefalo, \$2,366.50; William Barrett & Co., \$2,452.25; T. Coughlin, \$2,805; Daddario & Booth, \$2,974.75; V. Grande, \$3,895; Frank Drinkwater, \$3,913.75.

**Detroit, Mich.**—\*J. C. Garland, of Toledo, O., was recently awarded the contract for installing a modern and complete sewer system in Oakwood at a cost of \$185,000.

**Lansing, Mich.**—J. R. DeGraw, for the construction of a sewer in Hall St. from Ferris St. to Fremont St. \$617.42; was placed on file.

**St. Paul, Minn.**—Contract for the construction of a sewer 5 ft. north of the south line of lots 1, 2, 3, 4, 5 and 6, block 28 West St. St. Paul Proper from a point 10 ft. west of the east line of lot 1, block 28 West St. Paul Proper to Winslow Ave., to \*E. T. Webster, 437 Beacon St., at \$475. Engineer's estimate, \$495.

**St. Paul, Minn.**—Thornton Bros., 401 Scan. Am. Bank Bldg., \$1,287; engineer's estimate \$1,608, for the construction of a sewer on Belvidere St., between South Robert St. and Oakdale Ave.

**St. Paul, Minn.**—\*Thornton Bros., 401 Scan. Am. Bank Bldg., \$787. Engineer's estimate \$805, for the construction of a sewer on Standish Ave., between Raymond Ave. and the right of way of the N. P. Ry.

**St. Paul, Minn.**—Contract for the construction of a sewer on Brand St. from Phalen Ave. to Tracy Ave., to \*J. J. Connolly, of \$890. Engineer's estimate, \$1,056.

**St. Paul, Minn.**—For the construction of a sewer on Indiana Ave., between Starkey St. and Custer St., to \*Christ Johnson, \$658.05. Engineer's estimate, \$656.

**Winthrop, Minn.**—See "Water Supply." **Sedalia, Mo.**—Contract for construction of sewage disposal plant was let Nov. 6 to \*J. W. Menetree, Sedalia, Mo., for \$58,824. Berns & McDonnell, Consulting Engineers, Interstate Bldg., Kansas City, Mo.

**Collinswood, N. J.**—For storm sewer, \*Augustus Stutzer, Collinswood secured contract for about 1,500 ft. 24-in. terra cotta pipe. Engr. Remington E. Vosburg, Sixth & Market Sts., Camden, N. J. N. Humbrecht, Boro. Clerk, Collinswood.

**Elizabeth, N. J.**—For constructing a sewer in Amity St. for a distance of 150 feet, between Fourth Ave. and the Elizabeth River, to \*T. Foster Callahan, Linden, N. J., at \$364.40.

**New York City, N. Y.**—For extension sewer in 172d St. between Ft. Washington Ave. and Bway, \*P. J. Duffy secured contract.

**Akron, O.**—See "Streets and Roads."

**Cleveland, O.**—\*William McDowell & Son, constructing sewer in Dillwood road, N. E., from Nottingham road, N. E. to E. 177th St., approved by board of control, \$2,100.

**Cleveland, O.**—The \*Monson Co. construction of a sewer in Nottingham road N. E. from E. 174th St. to E. 177th St. approved by board of control: \$7,500.

**Cleveland, O.**—Board of control with the \*River Construction Co., approximately \$2,500, covering the construction of a sewer in Delevan road N. E. from E. 177th St. to Waterloo road N. E.

**Cleveland, O.**—Board of control with \*W. A. Green, amounting approximately \$52,000, covering the construction of a sewer in Shaker Blvd. S. E. from Woodhill road S. E. to easterly city limits.

**Cleveland, O.**—For construction of a sewer in Grovewood Ave. N. E. from E. 176th St. to Delevan road N. E. to \*Brookside Construction Co., approved by board of control, \$2,400.

**Cleveland, O.**—The \*Gawne Contracting Co., the lowest and best bidder for the construction of a sewer in E. 140th St., between St. Clair Ave. N. E. and Aspinwall Ave. N. E., \$27,386.

**Cleveland, O.**—\*The River Construction Co., construction of sewer in E. 176th St., from Nottingham road, N. E., to Waterloo road, N. E., \$6,000.

**Conesville, O.**—\*R. N. Kirk, 149 Mulberry St., Coshocton, for storm water sewer, 400 ft. 10 to 12-in. sewer pipe. Engineer, Arthur Shaw, Court House, Coshocton, O. Clyde Wheeler, Clerk, Franklin Township, Conesville.

**Portland, Ore.**—To \*R. Lee city let contract east side intercepting sewer in Washington St.

**Roseburg, Ore.**—The contract for the construction of the East Lane St. sewer was awarded to \*Henry Worthington and Earl Rhodes at \$673.

**Meadville, Pa.**—The council has awarded to \*Harris Construction Co. and the \*Keystone Construction Co. contracts for constructing sewers in Limber road, La-

**Lafayette, North, Water, Pine and Henry Sts.**

**Meadville, Pa.**—\*Keystone Construction Co., Penna. Bldg., three sanitary sewers, 3,300 lin. ft. 8-in. vit. sewer pipe, Morgan, North and Pine Sts., Engr., B. F. Miller, Jr., City Hall, Fred C. Klebert, City Clerk, City Hall.

**Philadelphia, Pa.**—\*Keystone State Construction Co., Penna. Bldg., for brick and concrete sewers, to cost about \$10,000, let by Penna. R. R. Co., Sam Rea, President, Broad St. Station.

**Okanogan, Wash.**—The County Comrs. awarded the contract for the construction of a sewer from the court house to Okanogan River to \*Claus Barnhardt, local, for 20 cts. per ft.

**Okanogan, Wash.**—County commissioners awarded contract for construction of sewer from court house to Okanogan River to \*Claus Barnhardt, local, for 20c per foot.

**Kenosha, Wis.**—Bids were opened for the construction of sewers on half a dozen streets of the city. The cost is going to be just about fifty per cent more than it cost to build the same kind a year ago. The list includes sewers on Sheridan Road, South Railway St., Howe and William St., an overflow from the trunk sewer on Sheridan Road and a short sewer on Garden St. Frandsen and Johnson were the low bidders, \$6,533.50. It is just possible that the council will decline to let contracts at these figures and that the whole matter will be laid over until the spring with a view of having the city build the sewers.

## WATER SUPPLY.

**Brawley, Cal.**—A \$17,000 municipal water plant is under consideration.

**Coalinga, Cal.**—The \$100,000 water works bonds carried at the election.

**Sacramento, Cal.**—City will be asked to vote between \$4,500,000 and \$6,000,000 bonds for a filtered water system, schools and municipal auditorium next April, according to a statement made by Thomas Coulter, Comr. of Pub. Wks.

**Washington, D. C.**—Bureau of Foreign and Domestic Commerce, Dept. of Commerce.—A firm in the United Kingdom desires to be placed in communication with American manufacturers in a position to supply wrought iron and steel pipes and fittings for water and gas service. References. Refer to Opportunity No. 23066.

**Arcadia, Fla.**—See "Streets and Roads."

**St. Cloud, Fla.**—For the installation of water works and sewer system bids are asked.

**Jonesboro, Ga.**—The City Council has approved resolution for a reservoir.

**Grace, Ida.**—The water system bonds carried at the election.

**Fisher, Ill.**—Water works bonds to amount of \$6,500 defeated at the election.

**Manlius, Ill.**—Village is to have a system of water works in the near future. Bond issue carried by a large majority.

**Watseka, Ill.**—The Council proposes to drill another well to increase the present water supply. Address Village Clerk.

**Connersville, Ind.**—City plans water system in east side. J. C. Massey, Supt.

**Fort Wayne, Ind.**—Bids will be advertised for by the board of works for roofing the city reservoir in accordance with plans prepared by Henry Meyer. The plans were approved by the board of works.

**Lake Mill, Ia.**—Preliminary plans are in progress for water works system, and for laying approximately 3 miles water mains and construction of reservoir. T. J. Severson, Clerk, Hawkeye Supply Co., Mason City, Ia.

**Arma, Kan.**—Water bonds amount of \$9,000 were sold to the State of Kansas recently.

**De Ridder, La.**—Mayor Davis and the board of aldermen are getting estimates on municipally owned pumping plant to supply the city with water. At the present arrangements, the city is getting its water from the Hudson River Lumber Co.

**Lafayette, La.**—The water works improvement bonds have been purchased by Messrs. Powell, Garard & Co. of Chicago; amount \$20,000.

**Linton, La.**—In the near future an election to vote on \$20,000 water works bonds.

**Lenox, Mass.**—State board of health desires that tests be made on Richmond Mountain at the site of the proposed dam for the new \$87,000 reservoir to determine whether the substrata is of the character satisfactory for the building.

These borings will be made at intervals of a few feet the entire length of the proposed dam and a record of the rock found at various depths will be reported. Request was sent to Engineer A. B. Farnham, of Pittsfield, consulting engineer for the water company.

**Birmingham, Mich.**—Election for two bond issues Dec. 14 for construction of water mains and drainage sewers.

**Mt. Clemens, Mich.**—Water works bonds to amount of \$12,000 defeated at the election.

**New Buffalo, Mich.**—See "Streets and Roads."

**Pontiac, Mich.**—City Comn. estimating sum of money needed for water department; an election may be called for the middle of December.

**Eveleth, Minn.**—A new water line is soon to be installed between Eveleth and the pumping station at St. Mary's lake. City clerk instructed to advertise for bids for 14,000 ft. of 16-in. water pipe, 1 in. thick.

**Eveleth, Minn.**—Moved and carried that the city clerk be instructed to advertise for bids for the installation and completion of 14,000 ft. of 16-in. cast-iron water pipe from St. Mary's Lake to the mains on Hayes St., according to the plans and specifications on file in the office of the city engineer.

**Glencoe, Minn.**—For water works system \$250,000 bond issue carried.

**Ironton, Minn.**—A \$15,000 bond issue carried for water works system, and \$20,000 for village hall. E. R. Burns, Clerk.

**Laurel, Minn.**—See "Streets and Roads."

**Sumrall, Miss.**—For 60,000 gal. reservoir. Bids will be received in December.

**Livingston, Mont.**—Plans for the construction of a municipal water plant were discussed by the city council, after word had been received that the state supreme court had ruled that the city of Livingston is not required by law to renew the contract with the Livingston waterworks. Taxpayers approved bonds issued in 1914 of \$225,000 for the construction of a plant, actual work of construction being postponed pending the decision of the supreme court.

**Livingston, Mont.**—Favorable court decision permits the city to proceed with the construction of a new municipal water works system, including filtration plant, for which plans have been prepared. Estimated cost, \$225,000. Burns & McDonnell, Engrs., Kansas City, Mo.

**Roundup, Mont.**—City will proceed with improvements on water system to include pipes laid 16 ft. underground, costing between \$3,200 and \$4,000.

**Wilsall, Mont.**—Steps have been taken looking to the incorporation of the city and the construction of a modern water plant and the purchase of adequate fire fighting apparatus.

**Fort Hancock, N. J.**—Bids are being asked for 50,000 gals. water tank and tower. Address Quartermaster.

**Canton, N. Y.**—For Adirondack Spring water position the taxpayers voted \$180,000.

**Lewiston, N. Y.**—Town Board will receive bids 12 noon, Dec. 9, for the purchase of \$5,000 water bonds.

**Wilmington, N. C.**—See "Streets and Roads."

**Fairmount, N. D.**—Engineers have not been selected to prepare plans for water works system to be installed during coming summer. Address L. N. Abbott, Mayor.

**Grand Forks, N. D.**—A bond issue of \$25,000 will probably be voted on for water works improvements.

**Grand Forks, N. D.**—A bond issue for the improvement of the city filtration plant, approved at the recent election, will stand the court test, according to City Attorney George A. Bangs.

**Grand Forks, N. D.**—The election Nov. 7 for water works improvement bonds \$25,000 carried. W. H. Alexander, city auditor.

**Cellina, O.**—The board of public affairs has asked council for an appropriation of \$15,000 to change the water works plant from the present water wells to a soft water supply to be obtained from the reservoir. Plans also provide for a complete change of the plant, for the purchase of a new city engine and electric generator.

**Cincinnati, O.**—In his report for 1915, submitted to Service Director Hornberger, Superintendent J. A. Hillier, of the waterworks, recommends replacement of the old three and four-inch water mains which supplied the city of former days, by an additional 17,000-gallon pump for the Eastern Hills service, an additional 7,000,000-gallon pump for the Western

Hills service, additional tanks for College Hill, a 24-inch main for St. Bernard, Elmwood, Carthage and Hartwell, a 17-in. main through Madisonville, a 16-inch main through Norwood and Pleasant Ridge, a 24-inch main to the Western Hills and a 12-inch main from Westwood to College Hill. Also suggests new contracts for the extension of mains into sections about to be built up.

**Circleville, O.**—Service Director Baker announces that he has contracted with Mr. Gampers of Columbus to be the consulting engineer for the construction of the municipal light and water plant of this city.

**Cleveland, O.**—Purchase of \$10,000 worth of chlorine for use in the city water supply was authorized by the board of control. The city will continue to use chlorine after the filtration plant is in operation, but a smaller amount will be placed in the water.

**Sandusky, O.**—Resolution by city commission to improve Lane St. from Wayne St. to Sycamore Line to Milan road by constructing a water main.

**Sandusky, O.**—Ordinances providing for water mains in Lane St. and Sycamore Line St. were passed. Commissioners approved plans for changing the line of the Railroad St. sewer and adopted an ordinance authorizing a contract.

**Sharon, O.**—Council has issued an order for the installation of a 25-HP. gas engine at the water works, the cost of which will be in the neighborhood of \$1,000.

**Beaver, Okla.**—The following bonds will be voted Dec. 11: Electric light, \$8,000; water works system, \$17,000.

**Cyril, Okla.**—The city contemplates voting on bonds to construct water works. Address the Mayor.

**Kaw, Okla.**—\$15,000 water works bonds will be voted on Dec. 8.

**Morrison, Okla.**—Nov. 7 election defeated to issue the following bonds: Water works, \$18,000; electric light, \$7,000. A. C. Newell, Town Clerk.

**Oklmulge, Okla.**—The city will install direct connected, electrically-driven pump with a capacity of 1,100 gallons per minute; 11,240 ft. of 10-in. pipe will be purchased. Address R. H. Jenness, commissioner of finance.

**Portland, Ore.**—Louis C. Kelsey, consulting engineer, Selling Bldg., is now at Twin Falls, Idaho, making surveys of water supply, preliminary to preparing plans and recommendations covering the proposed extension to the municipal water works, plans will be ready in February and actual work undertaken early next spring.

**Germantown, Pa.**—Councilman Robert Smith, chairman of the Highway Committee, introduced bills to lay water pipe in Ogontz Ave., from Chelton Ave. to City line, and to pave the street.

**Bishopville, S. C.**—See "Sewerage."

**Beaumont, Tex.**—The following bonds were approved: Wharves, docks, terminals, slips and other appliances for facilitating the navigation of the Neches River, \$230,000; water works extension, \$100,000.

**Port Arthur, Tex.**—See "Sewerage."

**Midvale, Utah.**—The proposition for a \$35,000 bond issue to purchase and improve the present water system carried. Of this amount \$25,000 will be used to buy the system now in operation, which belongs to Sandy. The remaining \$10,000 will be used in an extension, and to drawing the supply from higher up in the canyon.

**Norfolk, Va.**—The following resolutions were approved, appropriating \$310 for water pipe, etc., on Waverly way, Villa Heights; \$1,000 for chlorine plant at water works.

**Sturgeon Bay, Wis.**—\$35,000 in bonds have been issued for water works system. Address Jas. E. John, Supt. of water works. J. C. Langemak, City Clerk.

**St. John, N. B.**—Commissioner Wigmore has been authorized to purchase a 2-ton motor truck for the water and sewage department.

## BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates Contracts Awarded.)

**Earl Park, Ind.**—City let contract water system to \*National Co., South Bend, Ind.; about \$6,000.

**Boston, Mass.**—Nov. 23 the Mayor approved a contract with \*Antony Cefalo, at \$2,823, for relaying water pipes in Blackstone, Clinton and Thacher Sts., city proper. Bids for the work, opened Nov. 17, were as follows: V. Grande, \$3,112; John Guarino & Son, \$3,380; William Barrett & Co., \$3,720; John T. Shea, Jr., \$3,945.

**Boston, Mass.**—For asbestos covering for water pipe on Dana Ave. bridge, Hyde Park, Mayor approved a contract with the \*Norristown Magnesia & Asbestos Co., at \$372. Bids were as follows: Keasbey & Mattison Co., \$440; H. W. Johnson & Child Co., \$450; Nightingale & Child Co., \$850.

**Boston, Mass.**—\*William Barrett Co., at \$1,002.50, for laying water pipes in Verduin, Carruth, Leaven Sts., Hall Ave., and Southwick Sts., Dorchester. Bids were as follows: V. Grande, \$1,012.20; A. Cefalo, \$1,026; M. DeSisto, \$1,098; John Guarino & Son, \$1,106.80.

**Duluth, Minn.**—The resolutions awarding the contracts to the \*United States Cast Iron & Foundry Co. of Chicago for furnishing the water and light department with 1,000 tons of cast iron pipe for 1917, and to \*Jacobson Bros. for constructing the addition to the boiler room at the Lakewood pumping station on their bid of \$3,350, were laid over until next week. The bid of the United States Cast Iron Co. follows: 4-in. water pipe, \$41.30 per ton; 6-in. water pipe, \$38.30 per ton; 4-in. gas pipe, \$42.30 per ton, and 6-in. gas pipe, \$39.50 per ton.

**Waseca, Minn.**—For one triplex power pump and two slip ring type alt. current electric motors: James T. Muir & Co., 2395 University Ave., Minneapolis, Minn. Consulting Engr., W. C. Clark, 4821 Fremont Ave., S. Minneapolis, Minn.; E. A. Wobbschall, Clk.

**Winthrop, Minn.**—\*Gaylord Hardware Co., Winthrop, secured contract for water works system, sewerage system and 75,000 gallon tank and tower and pump house, \$45,490.

**Niagara Falls, N. Y.**—City Engr. reported Dominick Spaccone was the lowest bidder for laying an emergency water main in Evergreen St. to supply occupants of boathouse; \$219.20.

**Cleveland, O.**—The Cromwell Engineering Co., New Guardian Bldg., has awarded the \*Ohio Engineering Co., of Lorain, the contract for the construction of a water main to supply the plant of the Cromwell Co. on the east side river front at their bid of \$16,000. There will be 6,800 ft. of 12-in. pipe.

**Lima, O.**—Service Director Methane has contracted with the \*Solar Refining Co. to supply 2,500,000 gals. of water to the city daily. City at present is consuming an average of 3,750,000 gals. of water daily. The Lost Creek wells are expected to produce 1,250,000 gals. which will be needed with the Solar supply.

**Dallas, Tex.**—Contract was let to the \*Municipal Paving Co., to lay a pipe line from the end of the city water service to the County Detention Home on Thomas Hill. A bid of \$175 was accepted.

**Hamilton, Tex.**—W. E. Henderson, Sweetwater, secured contract water and distributing system; \$31,400.

**Seattle, Wash.**—Awarded by Board of Public Works: Rainier Ave., water mains, \*G. Argentieri & Co., 989 Rainier Ave., \$2,192.

**Madison, Wis.**—Contract for the new 8,000,000 gallon pump for the water works should be given to the Allis-Chalmers Co. of Milwaukee for \$32,750 and that for the new stokers to the Murphey Steel Works of Detroit, Mich., for \$3,125, was the recommendation of the board of public works to the city council. The installation of the new pump will increase the high service capacity of the local station from 2,500,000 to 8,000,000 gallons.

#### MISCELLANEOUS.

**Alameda, Cal.**—The City Council will consider the project of purchasing land on the north side for park and playground purposes.

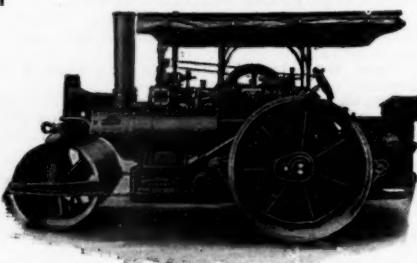
**Gilroy, Cal.**—The Mayor and Common Council have now determined on making a new levee, in place of the one washed out three years ago on the west side of the city, to keep the water from entering the streets at the times of overflow of the Uvas Creek. The firm of Miller & Lux, who is also interested, will share in the expense of building the same and the work will commence at once.

**Meredith, Cal.**—The county supervisors awarded to the Shattuck-Edinger Co., of Richmond, the contracts for construction of drainage systems for Livingston and Atwater. Price for the Livingston district, embracing 2,500 acres, was \$32,000. The Atwater district, which includes 7,000 acres, was \$65,000.

**Palo Alto, Cal.**—The city planning commission passed a resolution to have the proposed subway extend from the

## BUFFALO PITTS ROLLERS

Built for Service



Buffalo Pitts Standard Macadam Roller

Made in All Types and All Sizes  
for All Purposes. 2 1/2 to 20 Tons

Manufactured only by

**BUFFALO SPRINGFIELD  
ROLLER COMPANY**  
SPRINGFIELD, OHIO

bridge at the state highway diagonally to a point at Hawthorne Ave. Charles Cheney, city planning expert, was present and submitted an interesting report with plans of the subway.

**San Diego, Cal.**—Manager of Operation Lockwood has asked the city attorney's office to prepare ordinances providing for the cost of increasing the height of Morena Dam in accordance with the council's action. Plans and estimates prepared by City Engineer Cromwell estimate \$15,000 as the cost of adding 5 ft. of concrete wall to the dam. The purpose is to increase the capacity of the spillways and at the same time to add to the storage capacity, and in event of another storm. As soon as the council adopts the ordinance the manager proposes to advertise for bids to award the contract.

**San Diego, Cal.**—President H. F. Alexander of Pacific Steamship Co. arranged with city for docking of ships at Municipal Wharf.

**Vincent, Cal.**—The \$2,500,000 bonds of the newly created Terra Bella Irrigation district, recently formed to irrigate over 50,000 acres of foothill land, have been sold to the Kramer Co. of Los Angeles, at par.

**Washington, D. C. (Bureau of Foreign and Domestic Commerce, Dept. of Commerce).**—A commission agent in Greece wished to get in touch with manufacturers of motors, 3 h. p. to 15 h. p. Refer to Opportunity No. 23073.

**Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).**—An established import house in Brazil is interested in introducing American products into that country, and desires to secure exclusive agencies from American manufacturers of the following article: cement. Correspondence in English. References. Refer to Opportunity No. 23102.

**Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).**—A manufacturers' agent in Denmark wishes to enter into commercial relations with American manufacturers of automobiles, commercial trucks, etc. Correspondence in English. Reference. Refer to Opportunity No. 23101.

**Arcadia, Fla.**—See "Streets and Roads."

**Gary, Ind.**—125,000 acres of land in lower part of Lake County to be drained by Singleton Ditch. Contracts will be let shortly. The channel will be 44 miles long, 50 ft. wide at the bottom and 6 ft. deep, according to the survey report.

**Indianapolis, Ind.**—W. C. Bretz, secretary of the association, announces the sale of \$24,554.37 Hunley and Short Creek drainage bonds to Breed, Elliott & Harrison, of Indianapolis, for \$25 premium.

**Knox, Ind.**—Bids received Dec. 16, 1916, at 2 p. m., by Treasurer of Starke County, for sale, \$11,047.32 ditch bonds, 5 per cent, ten years Henry Luken, Treas.

**South Bend, Ind.**—Committee of the whole voted to report favorably concerning the appropriation of \$500 to be used for the repair of the patrol wagon and the expenditure of \$2,500 for the purchase of a new wagon.

**Ottumwa, Ia.**—Commercial Club Committee recommends the purchase of a road oiling machine by the city and county.

**Herington, Kan.**—Nov. 7 election defeated proposition to issue city hall bonds \$10,000. L. H. Riddle, city clerk.

**Newport, Ky.**—Garbage incinerator proposition was defeated at recent election.

**Lawrence, Mass.**—Mayor Hurley, members of the school committee delegated to consider the advisability of purchasing an automobile for the school department, decided to recommend the purchase of a runabout for the executive department and a small truck for the delivery department. In connection with the suggestion Mayor Hurley said he favored the erection of a municipal garage at which these machines if purchased, could be cared for as well as the three trucks and four runabouts now in use in several departments of the municipal service.

**Detroit, Mich.**—Alderman Dill will make another attempt to revive the proposed plan to construct a subway system; will introduce a resolution requesting the Committee on Public Utilities to consider the advisability of building a subway unit in Woodward Ave., also to prepare tentative plans and estimates on the cost of construction.

**Marquette, Mich.**—Nov. 7 election defeated issue of jail bonds to the amount of \$50,000.

**Traverse City, Mich.**—Action is being taken to solve the garbage problem. The plan now in use by Westerville, O., is being considered, that of issuing books containing coupons, entitling the property owner to so many emptyings of his garbage cans by gatherers in the city's employ. Agitation concerning the building of a local garbage incinerator will be brought before the members of council of chamber of commerce.

**Duluth, Minn.**—City may buy an asphalt plant. Such purchase, to replace the present ancient equipment, was suggested by Commissioner Farrell, head of the works division, who discussed the matter informally with the commissioners. No action will be taken until spring, it was announced.

**Atlantic City, N. J.**—Bd. of Engrs. met in New York City to revise the plans and specifications for the building of the big sea wall at Longport. The Bd. of Engrs., composed of John P. Meigs, of Philadelphia, formerly head of the Dept. of Docks and Wharves; the Case Coast Protection Corporation, and B. F. Cresson, Chief Engr. of the Bd. of Commerce and Navigation of New Jersey.

**Roselle, N. J.**—The election defeated park bonds to the amount of \$10,000. J. F. Ostrander, borough clerk.

**Buffalo, N. Y.**—Charles J. Quinn, city sealer of weights and measures, requests of council a one-ton truck and a \$75,000 park bonds was defeated at Nov. 7 election. E. M. Cook, Director of Finance.

**Syracuse, N. Y.**—Council to be asked to purchase Schenectady Milling Co. property to make an addition to the land owned by city constituting the Cotton Factory Hollow Park site and provide entrance from South Center St. to park. Can be purchased for approximately \$20,000 to \$25,000.

**Yonkers, N. Y.**—Common council discussed motor truck for collecting ashes and garbage. Decided to secure data of the plans of other cities.

**Wilmington, N. C.**—City Council to provide \$700 to improve drainage from Market St. between 17th St. and Burnt Hill Creek, a distance of three blocks, in the western section of city.

**Hamilton, O.**—See "Streets and Roads."

**Lima, O.**—River improvement \$1,000,000 bonds were sold to Spitzer, Rorick & Co. of Toledo for \$6,950.

**Massillon, O.**—See "Sewerage."

**Youngstown, O.**—Sixty-five thousand dollars for the construction of Dry Run Creek issues defeated at recent election.

**Youngstown, O.**—W. G. Reese, member of the council has asked the city engineer to make an estimate of the cost of

dredging the Mahoning River to prevent floods.

**Durant, Okla.**—Court house and jail bonds was successful at the election. \$100,000.

**Klamath Falls, Ore.**—The \$300,000 bond issue for the Strahorn railroad carried at a special election.

**Lakeview, Ore.**—The \$20,000 bond issue for the Strahorn railroad project carried at the election here.

**Carnegie, Pa.**—Municipal bonds, \$125,000, was successful at the election.

**Du Bois, Pa.**—Council accepted the agreement of Jones Brothers, Macon, Ga., for the installation of a single unit garbage incinerating plant; cost completed, \$5,000. The plant is to be odorless and will take care of from eight to ten tons of garbage, night soil and various other refuses every two hours; will be of corrugated iron and wood covering upon 12 ins. of brick walls. Owing to the law requiring advertising for bids for municipal purchases Council was unable to enter into a legal contract at once.

**Miller, S. D.**—Nov. 7 election here defeated the proposition to issue court house bonds to amount of \$100,000. County auditor.

**Beaumont, Tex.**—See "Water Supply."

**Goose Creek, Tex.**—Bids were ordered advertised by the county commissioners for an automobile for Commissioner Dreyling.

**Loose Creek, Tex.**—City is now assured of the much-wanted jail and court house. Bids were ordered advertised by Harris county for the building. Will be frame building and cost a few hundred dollars.

**Salt Lake City, Utah.**—Commercial Club adopted a resolution to urge upon the federal government the presentation of Little Zion Canyon as a national park, which is in St. George Co. The federal government has already appropriated \$15,000 for the construction of a roadway through the canyon and the state is building a road to its entrance.

**Spokane, Wash.**—Commissioner Funk now is planning to bring the question of street signs before the city council soon. In next year's budget \$2,500 is appropriated for new signs. The kind and several minor details remain yet to be settled by the city dads. It appears probable that in many places signs combining the name of the street with "Go Slow," or "Danger" signals to motorists will be put up. This proposal has been made by Commissioner Funk and is being received with favor by other commissioners.

**Fond du Lac, Wis.**—Nov. 7 election defeated proposition to issue park bonds \$50,000. J. F. Hohensee, city clerk.

**Port Dover, Ont.**—Engineer Lamp, of the Department of Public Works, Windsor, will prepare plans for dock improvements. Concrete and stone construction. Estimated cost, \$75,000.

**New Brunswick, Can.**—The city of Fredericton is endeavoring to procure in Canada a new snow-plowing apparatus for that city. It is suggested that American manufacturers of snowplows write at once, with full details as to prices, patterns, etc., to the City Clerk of the following towns in this district, all in New Brunswick: Fredericton, Woodstock, St. Stephen, Milltown, St. Andrews and McAdam. Snowplows made mostly or all of wood, imported from the United States, would probably come under item 506 of the general tariff, paying a duty of 25 per cent, with an additional surtax of 7 1/2 per cent ad valorem. Snowplows of iron or steel would be subject to a duty of 27 1/2 per cent ad valorem, including the surtax.

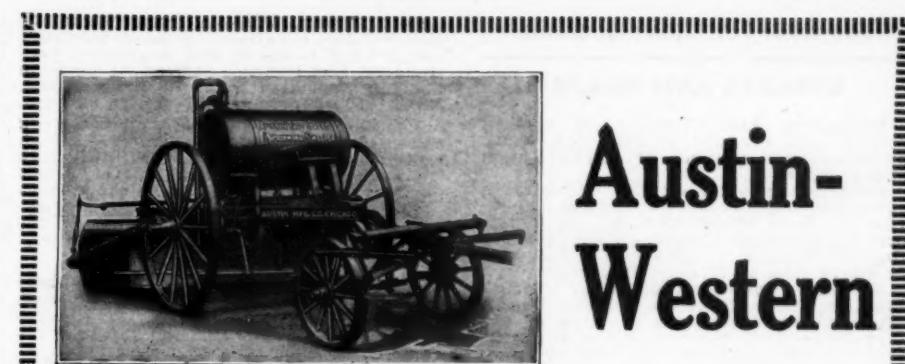
#### BIDS RECEIVED AND CONTRACTS AWARDED.

(\*Indicates contracts awarded.)

**Tintonka, Ia.**—\*Christian & Anderson, Tintonka, secured contract for constructing drains in drainage district No. 141 at \$7,112. E. H. Beardsley, Co. Aud.

**Flint, Mich.**—City has entered into a contract with the "United Engineering Co. of Chicago to build a sanitary reduction plant for garbage collection and disposal which will save the city about \$50,000 a year. The contract is to extend over a period of 20 years; at the end of the first 10 year period the city is given the right to purchase the entire plant and equipment at 50 per cent of its appraised value; at the end of the 15 year period at 25 per cent. of its appraised value; and at the expiration of the contract the entire plant and equipment will become the property of the city without charge.

**Duluth, Minn.**—W. C. Sargent was the lowest bidder to construct County Ditch



Austin Sprinkler Sweeper

## Austin-Western

Street and Road Machinery is made in our own factories. Each machine in our well known line is built under the supervision of experts in its special department.

AUSTIN WESTERN machinery is guaranteed to meet all modern requirements; to do its work efficiently and economically.

### We Manufacture:

#### Motor Road Rollers

#### Motor Tandem Rollers

#### Road Scarifiers

#### Rock Crushers

#### Road Oilers

#### Water Sprinklers

#### Dump and Stone

#### Spreader Wagons

#### Wheeled Scrapers

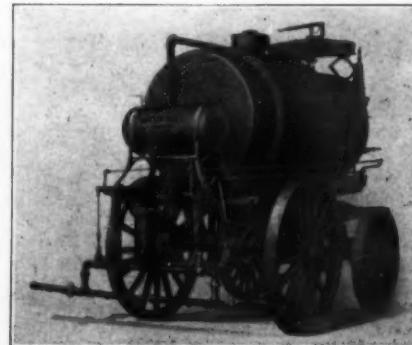
#### Drags and Plows.

Write for New Edition of  
ROAD BUILDER'S GUIDE

## The Austin-Western Road Machinery Co.

CHICAGO

Agents and warehouses covering every State in the Union



Austin Pressure Road Offer

No. 7, at \$26,037.97; is being considered by the county auditor and T. F. McGilvary, engineer in charge.

**Brooklyn, N. Y.**—The contract for dredging out upper Mill Creek Basin calling for the removal of 450,000 cu. yds. of material awarded to \*P. Sanford Ross, \$53,392.50; includes also the construction of 11,000 lin. ft. of street pile bulkhead along the Curley property to the west of Flatbush Ave. The dredging will extend from Flatbush Ave. to East 56th St. and a depth of 18 ft. of water will be secured. The material dredged will be used to fill in the up-land to a height of 10 ft. above the water level.

**Cleveland, O.**—\*Duff Construction Co., for the erection and completion of a combined refreshment stand, comfort stations and dressing rooms in Garfield Park. Bids received Nov. 2, \$12,523.50.

**Cleveland, O.**—\*J. J. Comerford, the lowest and best bidder, Nov. 17, for the construction and completion of the plumbing and heating of the comfort station at the corner of Broadway and E. 55th St., approximately \$1,488.

**Cleveland, O.**—\*Minnick-Gibbons Co.,

for the erection and completion of a comfort station on the corner of W. 14th St. and Abbey Ave., approximately \$6,046.

**Cleveland, O.**—Board of control authorized contract with \*Spilburg & Patmas, for construction and completion of the plumbing for refreshment stand, comfort station and dressing rooms in Garfield Park; cost, \$1,133.50. Bid received Nov. 2.

**Galveston, Tex.**—Commissioner Sappington recommended awarding to the \*Blodgett Construction Co. contract for along the crest of the city's fill between Sixth and 19th Sts. for \$6,001.60.

**Portsmouth, Va.**—Excavation work on the new dry dock will commence about Jan. 1 according to representatives of the firm of \*George Leary & Co., of New York, who has the contract.

**New Toronto, Ont.**—The general contract for the erection of an incinerator for the town council has been let to \*Reed Products Co., Standard Bldg. Toronto. Estimated cost, \$10,000.

**Toronto, Ont.**—A contract has been let for the straightening of the Don River through the Rosedale Golf Club grounds.

## Too Late for Classification

## STREETS AND ROADS

**Bessemer, Ala.**—Paving of several streets and avenues of this city being agitated by a number of business men and citizens.

**Birmingham, Ala.**—City Commission confirmed improvement ordinance to provide for certain improvements on Bessemer road, Ensley from the east property line of Avenue T, Ensley to the west property line of Avenue R, Ensley.

**Berkeley, Cal.**—Resolution for improving Lincoln St. from the eastern line of Chestnut St. easterly a distance of 372 feet to be graded; concrete curbs and gutters macadamized and surfaced with oil and rock screenings; a concrete storm culvert and a 6-in. vitrified ironstone pipe sewer.

**Oroville, Cal.**—\$5,000 for repairing two miles in the Wyandotte road and one mile in the Oroville-Bangor road, was voted by the Supervisors at the suggestion of Supervisor T. F. Whipple.

**Fresno, Cal.**—Resolution for the following work on alley in block numbered eighty-seven, to be graded curbed with redwood curbing, and paved with a 4-in. cement concrete base, and 1½-in. Bitulithic wearing surface.

**Fresno, Cal.**—Resolutions for improving alley in block numbered eighty-nine, be graded, curbed with redwood curbing, and paved with a 4-in. cement concrete base, and 1½-in. Bitulithic wearing surface.

**Sacramento, Cal.**—Sacramento Valley Development Association has submitted a brief statement to the State Highway Commission urging the construction of a State highway through the Fether River Canyon, connecting Oroville and Quincy.

**Fort Myers, Fla.**—A bond issue of \$190,000 for constructing hard surfaced and graded roads in the remaining portions of Lee County carried at election held in Special Road and Bridge Dist. No. 5. Plan includes 42½ miles of road.

**Heyburn, Ida.**—Members of the park commission decided to spend \$13,000 in building a beautiful scenic highway into the park grounds from the north. Work on the road will be started in the spring.

**Lewiston, Ida.**—Commissioners of Lapwai Valley Highway Dist. issued call for election Dec. 5 to vote on issuing \$150,000 bonds for road construction.

**Peoria, Ill.**—For about \$9,585 city plans to pave portion Pecan St. L. D. Jeffries, City Engr.

**Murray, Ky.**—The election defeated the road bond issue of \$100,000.

**Lawrence, Mass.**—Mayor Hurley will suggest that the section of Amesbury St., between Common and Valley, be paved immediately.

**Springfield, Mass.**—Dwight street will cost approximately \$1,267,274 in the report presented by the board of public works.

**Cadillac, Mich.**—City plans to pave portion Marble St. with concrete. Division and Cass St., brick. G. Johnson, City Clerk.

**St. John, Mich.**—Road improvement bonds amount of \$200,000 defeated at recent election.

**Sikeston, Mo.**—The following bond issues were voted: street \$10,000; sewer \$5,000. City Clerk.

**Passaic, N. J.**—Resolution authorizing Grove between Monroe St. and Oak St. be paved with asphalt-bound macadam, etc.

**Islip, N. Y.**—For road bonds Islip, Brentwood and Bayshore Villages voted \$26,000. Address Town Clerk, Islip.

## OFFICIAL ADVERTISING

**"Reaches Most Bidders at the Least Cost"**

Rate \$2 an inch. Copy reaching us by 10 a. m.  
Thursday will go in issue mailed that night.

**Mill Creek Improvement  
Project for Flood Control,  
Erie, Pa.**

Bids Opened December 19th, 1916.  
November 18th, 1916.

Sealed proposals will be received by the Council of the City of Erie, Pa., until 10:30 A. M. Standard Eastern Time, December 19th, 1916, when they will be publicly opened and read, for the construction of Flood Control works at Erie, Pa.

The project involves the construction of approximately two miles of reinforced concrete tube, 18 ft. by 22 ft. inside dimensions, and the principal items of construction are:

Earth Excavation,	107,000 cu. yds.
Rock Excavation,	132,000 cu. yds.
Reinforced Concrete,	56,600 cu. yds.
Reinforcing Steel,	800 tons
Structural Steel,	60 tons
Cast Iron Pipe and Specials,	90 tons

A certified check for Seventeen Thousand (\$17,000.00) Dollars will be required with the proposal.

Information for bidders, form of proposal and contract, plans and specifications, may be obtained on the deposit of certified check for One Hundred (\$100.00) Dollars, from Farley Gannett, Consulting Engineer, Telegraph Building, Harrisburg, Pa., or from his Erie office, 508 Palace Hardware Building.

The City Council reserves the right to reject any or all bids.

**FARLEY GANNETT,**  
Consulting Engineer.  
**FAULKNER G. LYNCH,**  
City Engineer.

**DIRECT Proposal  
Advertising Pays**

If you had to be operated upon you would go to a Specialist—a Surgeon—not a general practitioner.

**MUNICIPAL JOURNAL** is as much a specialist in **Municipal Necessities** as a surgeon is to medicine. Those who want to do business with Cities, Towns and Villages consult its weekly issues **first**.

ADVERTISE your call for bids in this live specialized weekly and you will get **more** bidders and **reduce** costs.

Rates \$2.00 an inch.

**MUNICIPAL  
JOURNAL**

50 UNION SQUARE NEW YORK

## FOR SALE

Two 10-ton Austin gasoline macadam rollers. Used but little. Low price. Write Cobb Construction Co., c/o The Municipal Journal.

## FOR SALE

**10-ton Macadam Roller.**  
Bargain price for immediate acceptance.  
Write

**EATON & SNYDER,**

Care of The Municipal Journal

## LIGHT EQUIPMENT

FOR THE CONTRACTOR  
RAILS, SMALL LOCOS, CARS, ROLLERS,  
For the Contractor  
TRACTION ENGINES STEEL PILING  
Before Buying Write

**ZELNICKER**  
WALTER A. ZELNICKER SUPPLY COMPANY  
St. Louis

510 Hennen Bldg., New Orleans  
423 First National Bank Bldg., Chicago  
General Office—325 Locust St., St. Louis

**TRANSITS AND LEVELS  
RENTED OR SOLD  
EASY TERMS**

**THE ENGINEERING AGENCY, Inc.**  
53 West Jackson St. Chicago

**INVITATION FOR PROPOSALS.**  
TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., November 22, 1916.—SEALED PROPOSALS will be opened in this office at 3 p. m., December 27, 1916, for the extension, remodeling, etc., of the United States Post Office and Court House at Oklahoma, Okla. Drawings and specifications may be obtained from the Custodian at Oklahoma, Okla., or at this office, in the discretion of the Supervising Architect, Jas. A. Wetmore, Acting Supervising Architect.

## Proposal Advertising

Municipal officials will serve their constituents well by seeing that PROPOSALS FOR MUNICIPAL IMPROVEMENTS of all kinds are inserted in

## MUNICIPAL JOURNAL

50 Union Square, New York